# THE MEANING OF HEALTH OF RURAL SASKATCHEWAN CHILDREN: A MIXED METHODS APPROACH

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ABSTRACT

**Background:** An understanding of the meaning of health is an integral component in the development of effective health promotion programs aimed at promoting health or preventing diseases such as childhood obesity. One group of Canadian children known to be at higher risk for obesity is those living in rural settings. The purpose of this current research was to explore the meaning of health of preadolescent children living in rural Saskatchewan. The following four research questions were addressed: (a) What are the general health characteristics of the study sample?, (b) What is the rural context of children participating in this study?, (c) What is the meaning (i.e. values, norms, beliefs, behaviors) of health from the perspectives of a group of preadolescent children?, and (d) Is the meaning of health thematically congruent from the perspectives of healthy weight and unhealthy weight children?. **Study Design:** Mixed methods explanatory sequential design (Participant selection model) with qualitative emphasis. **Methods:** Participants were recruited through classroom presentations and invitational letters sent out to all children attending a rural elementary school in Saskatchewan. Ninety-nine children (51.0% response rate) participated in the quantitative component [measurement of height and weight for purposes of determining healthy weight and unhealthy weight (overweight or obese) status and completion of health questionnaire examining dietary and physical activity patterns]. Of the children who met the selection criteria for qualitative follow up (Grade 4, 5, & 6 children who agreed to be interviewed and had a parent who agreed to be interviewed), twenty children and their parents were randomly selected to be individually interviewed for a total of 71 interviews. An observational assessment of the community was conducted by the researcher for the purpose of gaining a greater

understanding of the rural context in which the study participants construct their meaning of health. **Results:** Prevalence of unhealthy weights in these rural children was high (34%) with gender differences evident at a very young age. Regardless of weight or health status, children described their cultural meaning of health as an integration of *Knowing Stuff, Having a Working Body*, and *Feeling Happy*. Of these three themes *Feeling Happy* was recognized as the most meaningful and children described that receiving encouragement and support from valued relationships contributed to their happiness and overall meaning of health. The rural environment appeared to provide a sense of safety, security, and freedom in which children frequently engaged. **Significance of Findings:** The high prevalence of unhealthy weights in this sample of rural children has the potential to negatively influence the present and future health of these children. Developing an understanding of the cultural meaning of health and how this culture may influence patterns of healthy behaviors may be a foundation to the development of successful interventions aimed at promoting healthy weights in rural children.

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# Introduction

Childhood, and specifically preadolescence, appears to be a productive period for the development of knowledge, beliefs, and behaviors relating to health (Natapoff, 1978). These factors may all have an impact on children's present health and on their future health as adults. Developing an accurate understanding of children's beliefs of health are necessary for the development of effective and age-appropriate health promotion programs (Piko & Bak, 2006). Presently, an area of children's health that is of particular concern is that of childhood obesity. In the last two decades the prevalence of childhood obesity has increased remarkably with this increase being greater in Canada than in several other countries (Janssen, I., Katzmarzyk, P., Boyce, W., Vereecken, C., Mulvihill, C., Roberts, C. et al., 2005). In Canada there also appears to be a geographical difference where a higher prevalence of obesity is evident in rural children compared to their urban counterparts (Brunner, Lawson, Pickett, Boyce, & Janssen, 2008; Plotnikoff , 2004). Although children's understanding of health has been explored in several countries (Backett & Alexander, 1991; Bird & Podmore, 1990; Boruchovitch & Mednick, 1997; Natapoff, 1978) few studies have been conducted in Canada (Normandeau , Kalnins, Jutras, Hanigan, 1998), and few have been conducted with rural children (Normandeau et al., 1998; Onyango-Ouma, Aagaard-Hansen, & Jensen, 2004; Piko & Bak, 2006). Additionally, despite the excess of interventions aimed at obesity prevention, or reducing childhood obesity, the prevalence of this disease remains high and there is limited conclusive evidence on the most effective and sustainable method for preventing overweight and obesity in children (Brown & Summerbell, 2009; Summerbell, Waters, Edmunds, Kelly, Brown, & Campbell, 2005). A strategy that may contribute to

developing effective health promotion programs and interventions aimed at obesity prevention for children is to design interventions that are congruent with the cultural meaning (i.e., values, norms, beliefs, & behaviors) of health in those children who appear to have a high need for such interventions, such as rural Canadian children. Thus, it is important to increase our understanding of children's cultural meaning of health and use this understanding as a foundation for the development of future interventions.

Currently, the childhood obesity epidemic is a health challenge that may result in the present generation of children and youth experiencing poorer health and living shorter lives than that of their parents (Olshansky et al., 2005). The current and future health consequences of excess weight in childhood are well documented. Obesity can affect virtually every organ system in a child's body (Choudhary, Donnelly, Racadio, & Strife, 2007) potentially resulting in immediate (e.g., metabolic, orthopedic, neurological, pulmonary, gastroenterological, endocrine, social, emotional), intermediate (e.g., cardiovascular disease), and long-term (e.g., adult morbidity and mortality) health consequences (Must & Strauss, 1999).

The etiology of overweight and obesity is multifactoral. Contributing aspects to the obesity epidemic include demographic, community, and societal characteristics (e.g., socioeconomic status, accessibility to healthy foods, crime rates); parent and family characteristics (e.g., parenting styles, weight status of parents, family leisure time); and child characteristics (e.g., gender, physical activity patterns) (Davison, & Birch, 2001). Additionally, factors at the international (e.g., globalization of markets, economic development of countries) and national (e.g., urbanization, media, culture) levels have

also been included in the *causal web* or the interrelated network of causal factors contributing to obesity (Public Health Approaches to Prevention of Obesity, 2007).

Childhood obesity has reached epidemic proportions in many countries around the world including Canada (Tremblay, Katzmarzyk, & Willms, 2002; Wang & Lobstein, 2006). The prevalence of childhood overweight and obesity in the Canadian population has increased remarkably compared to child populations in many other countries (Janssen et al., 2005). In Canada, the rate of increase in obesity has been greater in children than in adults (Tremblay et al., 2002) and the prevalence of obesity appears higher in rural youth compared to their urban counterparts (Brunner, Lawson, Pickett, Boyce, & Janssen, 2008). In Saskatchewan, 29% of children aged 2 to 17 years are classified as overweight, which is higher than four other Canadian provinces (i.e., Alberta, Quebec, British Columbia, and Ontario) and slightly higher than the national prevalence of 26% for childhood overweight (Shields, 2005). While evidence clearly suggests that overweight and obesity is of great concern, it may be an even greater concern for Canadians, for children, and for those living in rural areas.

The seriousness of the obesity epidemic has prompted numerous interventions aimed at obesity prevention. The majority of intervention studies were conducted in school environments with fewer studies conducted in home or community settings (Flynn et al., 2006). Systematic reviews of school-based interventions have reported various degrees of success in preventing overweight in children and are inconsistent in suggesting the best approach (i.e., dietary interventions aimed at improving nutritional intake versus physical activity interventions aimed at increasing physical activity and/or decreasing sedentary behavior versus a combination of dietary and physical activity interventions) to

preventing weight gain in children (Brown & Summerbell, 2009; Doak, Visscher, Renders, & Seindell, 2006). Other reviews that have examined community, school, or family interventions that targeted children and/or their families have suggested that interventions have not had a significant impact on the weight status of children (Boon & Clydesdale, 2005; Summerbell et al, 2005). Numerous recommendations from these reviews have been made for future research in this area of study some of which include: (a) increasing the number of long term studies to evaluate sustainability of interventions, (b) using a multicomponent approach to obesity prevention, (c) involving parents and families in the development, implementation, and evaluation processes and (d) using qualitative methods to inform design of interventions (Boon & Clydesdale, 2005; Peterson & Fox, 2007; Summerbell et al., 2005). The lack of conclusive evidence on the most effective and sustainable methods for preventing overweight and obesity in children illustrates the need for innovative research in this area of study that may inform future interventions.

In children, changes in personal health habits such as patterns of physical activity, sedentary behavior, and dietary practices have been found to be contributing factors to the rise in childhood obesity (Anderson & Butcher, 2006). Fundamental to the prevention of obesity in children therefore is the promotion of health and healthy behaviors. Developing an accurate understanding of children's meaning of health are necessary for the development of effective and age-appropriate health promotion programs (Piko & Bak, 2006). The meaning of health is associated with the developed culture that is created within social and environmental contexts (Alexamder & Seidman, 1990; Loustaunau & Sabo, 1997). Culture has been described as a powerful determinant of behavior and is

influential in shaping individuals judgments and perceptions (Swartz & Jordan,1980). Culture consists of a system of cultural meanings that have four main functions: representational (i.e., knowledge and beliefs), constructive (i.e., creation of constructed realities and values), directive (i.e., norms and behaviors), and evocative (i.e., affectively linked associations) (D'Andrade, 1984). The cultural meanings however cannot be distinctly divided or labeled but rather surface as integrated ways of believing, valuing, knowing, and doing (D'Andrade, 1984; Swartz & Jordan,1980). A strategy that may contribute to the development of effective health promotion programs and interventions aimed at obesity prevention is to gain an understanding of the cultural meanings related to health of children, particularly of those children who appear at higher risk for obesity such as Canadian children and children residing in rural settings.

A continuing challenge in the overall study of rural populations is how rural is operationally defined. Currently, there is no universally accepted definition of 'rural' in Canada which presents difficulties interpreting and comparing the findings of research studies with rural populations (CIHI, 2006). Several definitions are used by Statistics Canada and are based on different criteria (e.g., population size, density, commuting distances) with each resulting in different thresholds (du Plessis, Beshiri, & Bollamn, 2002). Specifically identifying the definition utilized within a research study would aid in clarifying the population under study. Perhaps the most useful definition of rural is one that incorporates a "modified" Beale Code (du Plessis, Beshiri, & Bollamn, 2002) and can be used to identify rural and urban regions. Predominantly rural regions (Code 8 or 9) or regions "containing no urban settlements (i.e. no places of 2,500 or more people) and adjacent to (Code 8) or not adjacent to (Code 9) a metropolitan area have been used

in reporting health outcomes in rural populations by Statistics Canada (du Plessis, Beshiri, & Bollamn). For the purposes of the present study, the rural population selected for study would live within a rural region with a Beale Code of 9.

*Review of the Literature*

To gain an understanding of the current state of knowledge on the meaning of health in preadolescent children the review of scientific literature focused on those research studies that explored the concept of health from the perspective of preadolescent children. Studies that measured patterns of health behaviors (e.g., physical activity, dietary intake) were not included in this review as these studies focused on quantitatively measuring specific behaviors and not children's meaning of health. The literature reviewed is summarized in Table 1. Although the present study focused on the meaning of health of children living in the rural setting, the literature review included studies conducted with children in rural and urban settings. Missing from several studies was the geographical location (i.e., rural or urban) in which the research was conducted. As evident in Table 1, when identified in the research study, the geographic location (i.e., rural or urban) of the study is specified. The following discussion is a synthesis and critique of the sample, research methodology and overall findings of the studies included in the literature review. The conclusion will summarize the major contributions of the studies to this area of research and will identify the gaps in the research that will be addressed in the present research study and potentially in future research.

A total of 19 publications were found after a search of studies conducted in English and indexed in MEDLINE, CINAHL, ERIC, and PsycINFO data bases. The key words used in the literature search relating to preadolescent children and health were:

culture, opinions, beliefs, attitudes, values, norms, understanding, and perceptions. The references of the generated studies were examined for any additional studies that may be relevant to this research study. Of the 19 studies, 8 were excluded because they focused on illness or disease, health care, barriers to health, or children's preferences of foods and/or exercise. Of the 11 studies included in this review, there were no studies that focused specifically on the cultural meaning of health in children or the culture, that is, the beliefs, norms, behaviors, and values (LeCompte & Schensul, 1999) that constitute meaning (Spradley, 1979) of health in children. The reviewed studies primarily explored children's perceptions of health or the ability to understand (Merriam-Webster, 1997) the concept of health and the children's knowledge relating to health.

Of the 11 studies, 4 focused exclusively on the children's perception of health (Hester, 1987; Natapoff, 1978; Normandeau , Kalnins, Jutras, & Hanigan, 1998; Rashkis, 1965). Researchers in other studies have suggested that identifying children's knowledge of health and illness would enhance health education aimed at promoting healthy behaviors in children (Eiser et al., 1983) and preventing illness and disease (Altman & Revenson, 1985). In the remainder of the studies reviewed the perception of health was explored simultaneously with children's general knowledge of illness (Altman & Revenson, 1985; Boruchovitch & Mednick, 1997; Piko & Bak, 2006), knowledge of specific illnesses (e.g., colds, tummy upsets, nits, fractured arm, diarrhea) (Bird & Podmore, 1990; Eiser, Patterson, & Eiser, 1983; Onyango-Ouma, Aagaard-Hansen, & Jensen, 2004) or of specific diseases (e.g., cancer, chicken pox, whooping cough, malaria) (Bird & Podmore, 1990; Eiser et al., 1983; Oakley, Bendelow, Barnes, Buchanan, & Husain, 1995; Onyango-Ouma et al., 2004).

*Characteristics of studies reviewed.* The majority of studies exploring health in preadolescent children (aged 5 – 14 yrs) had sample sizes of 128 children or fewer (Altman & Revenson, 1985; Bird & Podmore, 1990; Boruchovitch & Mednick, 1997; Eiser et al., 1983; Onyango-Ouma et al., 2004; Rashkis, 1965) and used purposive sampling selection (Bird & Podmore, 1990; Eiser et al., 1983; Hester, 1987; Natapoff, 1978; Normandeau et al., 1998; Oakley et al., 1995; Onyango-Ouma et al., 2004; Piko & Bak, 2006; Rashkis, 1965). Larger samples were evident in three studies with samples of 264 (Natapoff, 1978), 225 (Hester, 1987) and 1,674 children (Normandeau et al., 1998). In two studies children were randomly selected from class rosters across several grades in one (Altman & Revenson, 1985) or two schools (Boruchovitch & Mednick, 1997). The study design of these mixed methods studies reflected the research questions that emphasized the quantitative component (i.e., describing, examining, comparing) and methods of analysis (e.g., frequencies, chi square) identified within the studies. Although these studies contributed to the breadth of knowledge of children's understanding of health, they lacked the depth of knowledge that is attainable when qualitative approaches have more emphasis within a study. Future research that elicits children's meaning of health through in-depth qualitative approaches would contribute to a greater understanding of health in children. Discovering the meaning of health from the children's perspective may provide health professionals with valuable insights of aspects that foster children's health and thus may be incorporated into health promotion programs with this population.

Table 1 Studies Exploring the Perception of Health from the Perspective of Preadolescent Children

| Author | Year | Location | Population | Methodology | Results |
|---|---|---|---|---|---|
| Rashkis S. | 1965 | United States<br>Urban | N = 54<br>Ages: 4 - 9 yrs | Mixed methods | The majority of responses indicated that health was a pleasant feeling, not being sick and included personal responsibilities (i.e. eating activities and hygiene) and dependence on adults such as doctors and parents. |
| Natapoff, J. | 1978 | United States<br>Urban | N = 264<br>Ages: 6 – 12 yrs | Mixed methods | Health and feeling healthy were most frequently described as feeling good (67%), being able to participate in desired activities (61%), and not being sick (48%). |
| Eiser, Patterson, & Eiser | 1983 | United Kingdom | N = 80<br>Ages: 6 – 11 yrs | Mixed methods | Health most frequently described as not being ill, eating good food, exercising, and being strong and energetic. |
| Altman & Revenson | 1985 | United States | N = 101<br>Ages: 8 – 14 yrs | Mixed methods | Approximately 51% of respondents described health as feeling good or being in good physical or mental health, 30% reported good health habits and 25% reported and absence of disease |

| | | | | | |
|---|---|---|---|---|---|
| Hester, N. | 1987 | United States<br>Urban | N = 225<br>Ages: 6 – 13 yrs | Mixed methods | Categories and proportions of responses relating to health: Activity/exercise (17.6%); Personal grooming (19.1%); Physical health (16.5%); Nutrition (14.1%); Behavior (11.4%); Emotional Health (6.3%) |
| Bird & Podmore | 1990 | New Zealand<br>Urban | N = 52<br>Ages: 5 – 9 yrs | Mixed methods | The majority of children reported there were actions they could do to stay healthy. The most frequently reported strategies were: eating properly, getting exercise, and hygiene |
| Oakly, Bendelow, Barnes, Buchanan, Husain | 1995 | England<br>Urban, suburban, rural | N = 226<br>Ages: 9 – 10 yrs | Mixed methods | The major categories identified with health included healthy food (73%), exercise (71%), hygiene (15%), not smoking (12%), and sleep (9%). |
| Boruchovitch & Mednick | 1997 | Brazil<br>Urban | N = 96<br>Ages: 6 – 14 yrs | Mixed methods | The most frequent definitions of health included positive feelings (i.e., how people feel as a consequence of being healthy) (40.8%); health practices (i.e. actions taken or intentionally not performed) (26.4%); not being sick (13.6%;, and ability to do desired activities (9.6%). |

| | | | | | |
|---|---|---|---|---|---|
| Normandeau, Kalinins, Jutras, & Hanigan | 1998 | Canada<br>Urban & rural | N = 1, 674<br>Ages: 5 – 12 yrs | Mixed methods | Three main criteria were identified for good health: functionality (i.e. participation in sports, absence of disease) (50.8%); mental heath (i.e. well being and relationships with others) (39.4%); and health behaviors (i.e. diet, activities, sleep, hygiene) (32.1%) |
| Onyango-Ouma, Agaard-Hansen, & Jensen | 2004 | Kenya<br>Rural | N = 40<br>Ages: 10 – 15 yrs | Quasi-experimental | Health was described as functionality (i.e. doing wanted things) 58%; mental health (i.e. being happy not sad, peaceful, absence of worries) (48%); lack of pain (40%); being active (35%), feeling good (25%); health promoting actions (23%); strong body (15%), absence of disease (13%). |
| Piko & Bak | 2006 | Hungary<br>Rural | N = 128<br>Ages: 8 – 11 yrs | Mixed methods | Definitions of health included near equal frequency of biomedical (i.e. lack of illness) and holistic (i.e. psychological and social dimensions) concepts of health. Elements of a healthy lifestyle included regular activity and healthy eating |

*Research methodology.* The majority of the studies used a mixed methods design in which the qualitative data was transformed and subsequently reported descriptively (e.g., frequencies, proportions, differences between groups). One study used a quasi-experimental design (See Table 1) to develop and evaluate an educational intervention aimed at building children's capacities for health action (Onyango-Ouma et al., 2004). The qualitative findings (i.e., pre and post intervention) within this study were also transformed and reported descriptively. Most mixed methods studies did not state the specific approach utilized in the qualitative component of the study, except for one study (Onyango-Ouma et al., 2004) stated that an ethnographic approach was incorporated into developing the specific intervention for the children living in the rural setting in Western Kenya. In this study however further elements of an ethnographic approach in the interview questions or the data analysis was not evident. Several studies specifically stated that content analysis was used in analyzing the qualitative findings of the studies (Altman & Revenson, 1985; Boruchovitch & Mednick, 1997; Hester, 1987; Normandeau et al., 1998). The remainder of the studies did not state a specific approach to data analysis making it difficult to compare and assess studies.

The qualitative data were collected through individual interviews in the majority of the mixed methods studies (Altman & Revenson, 1985; Bird & Podmore, 1990; Boruchovitch & Mednick, 1997; Eiser et al., 1983; Natapoff, 1978; Normandeau et al., 1998; Oakley et al., 1995; Onyango-Ouma et al., 2004; Rashkis, 1965) and through classroom sessions where the children wrote out answers to questions delivered by a teacher or a researcher (Hester, 1987; Piko & Bak, 2006).

Most studies used structured or semi-structured interview guides when collecting the qualitative data. Two studies used the draw and write technique where children were encouraged to draw pictures with a corresponding written explanation in response to questions about health (Onyango-Ouma et al., 2004; Piko & Bak, 2006).

*Differences in qualitative findings.* In an effort to compare the qualitative findings of the reviewed studies, all study findings were classified using Sandelowski and Barroso's (2003) typology for qualitative findings (See Table 2). In this classification method, findings from qualitative studies were classified on a continuum (i.e., no finding, topical survey, thematic survey, conceptual/thematic description, interpretative explanation) based on their "interpretative distance" from the raw data (Sandelowski & Barroso, 2003). While Sandelowski suggested the typologies indicate differences in types of findings and not in the quality of the findings, the typologies of 'no-finding' and 'topical survey' lack the interpretation required to be considered in the domain of qualitative research. As shown in the results of the studies in Table 1, the findings of the review studies focused on the frequencies and/or proportions of the responses or the categories generated through content analysis from the children's responses. Using Sandelowski's typology, these findings are consistent with the characteristics of topical surveys. Although the findings of these studies lack the interpretive characteristics of qualitative research they are consistent with the corresponding purposes of the studies which suggest a quantitative approach or priority such as (a) to investigate children's ideas of health and illness (Eiser et al., 1983); (b) to examine the relationship of age, gender, and illness experience to health (Altman & Revenson, 1985); (c) to examine the

understanding of both health and illness in the same children (Bird & Podmore, 1990); or (d) to describe children's conception of health (Normandeau et al., 1998).

Table 2

Typology of Qualitative Findings

| Typology | Characteristics | |
|---|---|---|
| No-finding report | - data is presented as if they were findings<br>- interview data is reproduced in a reduced form with minimal or no interpretation<br>- do not interpret the meaning of the qualitative data or where the meanings fit within the larger context<br>- are not research and specifically not qualitative research | Closest to data |
| Topical survey | - reduction of qualitative data in methods that remain close to the original data<br>- emphasis on nominal or categorical data, inventories, frequencies, or proportions of topics or categories<br>- topics introduced by the researcher in the interviews or derived from content analysis<br>- findings often organized by the questions asked, by the prevalence of topics raised, or by some surface classification system<br>- may qualify results with quotes<br>- is considered a form of research but not a form of qualitative research | |
| Thematic survey | - reflects a greater degree of data transformation by moving away from listing topics to describing themes<br>- conveys an underlying pattern recognized in the data, themes used to label and order portions of data<br>- explores a range of themes within and across participants and offers a more penetrating description of experiences<br>- considered low level of abstraction in qualitative research | |
| Conceptual/Thematic description | - findings are in the form of one or more concepts or themes developed from the data or from existing theories or literature outside the study<br>- interpretively integrating portions of the data<br>- interpretive use of concepts or themes to recast portions of data<br>- extends the interpretation to illuminate the experience | |
| Interpretive explanation | - data is transformed to produce grounded theories, ethnographies and fully integrated explanations of a phenomenon or events<br>- offers a coherent model that addresses causality or importance<br>- offers a specific view in explaining a phenomenon | Farthest from Data |

*Note.* Adapted from Sandelowski and Barroso (2003)

*Studies of rural children*. Three studies reported responses from samples of rural children (aged 5 – 15 yrs). These studies reflected samples from three countries; Hungary (Piko & Bak, 2006), Kenya (Onyango-Ouma et al., 2004), and Canada (Normandeau et al., 1998). An additional study conducted in England (Oakley et al., 1995) included children living in urban, suburban, and rural settings, however the findings did not report differences based on geographical locations. Although geographical differences may result in a meaning of health that is unique for a particular geographical region, the above three studies of rural children reported similar findings. Overall, the three studies reported that rural children had a multidimensional perception of health that included functionality (e.g., playing sports), mental health (e.g., feeling good about oneself), positive lifestyle behaviors (e.g., diet, exercise, sleep), and social behaviors (e.g., relationships with others). The findings in two studies (Normandeau et al., 1998; Onyango-Ouma et al., 2004) suggested that children reported functionality most frequently as contributing to health compared to any other responses (i.e., mental health or lifestyle behaviors). Normandeau and colleagues (1998) compared health perceptions between rural and urban children living in Canada and reported that differences in health perceptions were evident between levels of socioeconomic status rather than geographic location. In this study rural and urban children living in higher socioeconomic environments placed a stronger emphasis on the importance of maintaining healthy lifestyles with healthy diet and physical activity than rural and urban children living in lower socioeconomic conditions. While the study conducted by Normandeau and colleagues explored socioeconomic environments of children's lives this study did not explore other more specific aspects of the rural environment such as the physical or social surroundings in which children

interact. The culture developed within a particular social and environmental context is influential in the development of patterns of health behaviors and subsequently in the overall meaning of health of the population.

*Summary of findings of reviewed studies.* The overall findings from the research studies within this review were categorized into three main areas: (a) children's definitions of health, (b) children knowledge of health behaviors, and (c) the developmental differences in children's perceptions of health.

The majority of studies discovered children's definition of health and described the definitions in relation to the developmental differences related to the children's age. Overall, children believed that health was a positive state and appeared to hold a multidimensional view of health that included physical and emotional components. With age, children appeared to develop an understanding of health that was more abstract and complex. Findings suggested that while younger children (aged 6 - 9 yrs) tended to report health in terms of health practices (e.g., eating well and exercising) and specific states (e.g., not being sick, being strong and full of energy) (Altman & Revenson, 1985; Eiser et al., 1983; Piko & Bak, 2006; Rashkis, 1965), older children (aged 10 – 14 yrs) also included multidimensional and abstract views of health which included mental health, functionality, and a healthy lifestyle (Altman & Revenson, 1985; Boruchovitch & Mednick, 1997; Eiser et al., 1983; Hester, 1987; Natapoff, 1978; Onyango-Ouma et al., 2004; Piko & Bak, 2006).

In exploring children's perceptions of health several studies elicited children's knowledge about the factors that contributed to health in general. These studies reported that children most frequently discussed the importance of a healthy diet and regular

exercise to health (Altman & Revenson, 1985; Bird & Podmore, 1990; Boruchovitch & Mednick, 1997; Eiser et al., 1983; Normandeau et al., 1998; Piko & Bak, 2006). Other health practices that children also described, but with less frequency, as being important to health were personal hygiene, dental health, sleep, general cleanliness, and not smoking (Bird & Podmore, 1990; Eiser et al., 1983; Hester, 1987; Oakley et al., 1995; Onyango-Ouma et al., 2004; Rashkis, 1965). Three studies reported that children included hospitals (Oakley et al., 1995) or visiting a doctor (Altman & Revenson, 1985; Rashkis, 1965) as also contributing to health.

Three studies examined gender differences in children's understanding of health (Altman & Revenson, 1985; Natapoff, 1978; Oakley et al., 1995). Two studies reported no statistically significant differences in the perceptions of health between boys and girls (Altman & Revenson, 1985; Oakley, Bendelow, Barnes, Buchanan, & Husain, 1995) and one study reported significant gender differences in only two categories with more girls reporting cleanliness and more boys reporting a strong body as aspects important to health (Natapoff, 1978).

The review of the literature on studies that explored children's perceptions of health yielded relatively consistent information on the knowledge and understanding of health in preadolescent children. These studies suggested that children view health from a holistic (i.e., physical health and mental health) and/or biomedical (i.e., absence of disease or illness) perspective. Children's conceptual ability in the development of their health related knowledge appeared to increase with age resulting in increasingly complex and abstract perceptions of health by the time children reach adolescence. Findings also

suggest that children appear to be knowledgeable about the factors that are needed to obtain and maintain health such as physical activity and a healthy diet.

Only three studies were conducted with rural children (Normandeau et al., 1998; Onyango-Ouma et al., 2004; Piko & Bak, 2006) and of those three studies only one was conducted with rural children living in Canada (Normandeau et al., 1998). Further research that focuses on rural child populations in Canada would prevent imposing the 'urban focused' knowledge generated from previous studies on the rural child populations. Additionally, further research of the rural environment from the perspectives of children is limited and would be beneficial to the development of health promotion programs that are specifically tailored to this rural aggregate.

The literature reviewed demonstrated that the health education has been consistently effective in educating children about health and health behaviors. While the findings of the literature review of the mixed methods studies lacked interpretive dimensions, they provided a valuable descriptive foundation on which to base our understandings of children's knowledge of health. These findings are particularly useful during the current obesity epidemic when the promotion of health and of healthy behaviors in children is of utmost importance. Further research that builds on the present literature by exploring the deeper understanding of children's cultural meaning of health (i.e., values, beliefs, norms, behaviors) and yielding increasingly interpretive qualitative findings (e.g., conceptual thematic descriptions, interpretive explanations) would add another dimension in our understanding of this area of study. This additional knowledge may be useful for those health professionals interested in advancing the development of

effective and sustainable health promotion programs aimed at promoting health and healthy weights in children.

Further research is needed to (a) add depth to our understanding of children's cultural meaning of health, (b) include the perspectives of rural children in the context of their environment, (c) include the perspectives of a group of children living in Canada, and (d) discover aspects of children's cultural meaning of health that may foster healthy lifestyles and healthy weights in children.

## Purpose of the Study

The purpose of this study was to explore the meaning of health of preadolescent children living in rural Saskatchewan.

The research questions that guided the study were:

1. What are the general health characteristics of the study sample?
2. What is the rural context of children participating in this study?
3. What is the cultural meaning (i.e., values, norms, beliefs, behaviors) of health from the perspectives of a group of preadolescent children?
4. Is the cultural meaning of health thematically congruent from the perspectives of healthy weight and unhealthy weight children?

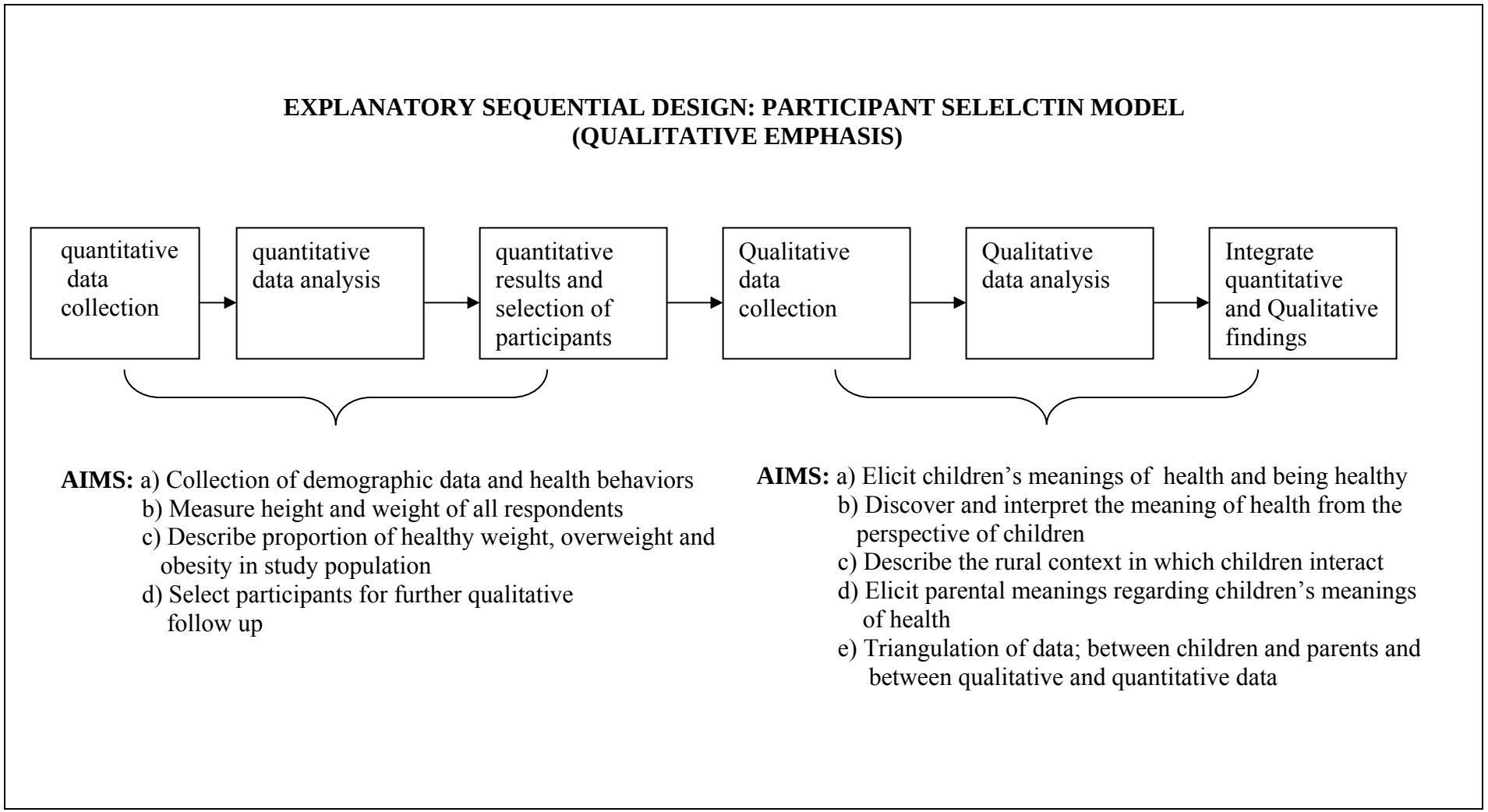
Three papers were written to address the purpose and the research questions of the study. Discussion of the methodology, an examination of health characteristics of the study sample, and an exploration of the children's meaning of health were reflected within the following papers. The first paper of the dissertation examines issues to consider when using Creswell and Plano Clark's (2008) Mixed Methods Explanatory

Sequential Design: The Participant Selection Model with a Qualitative Emphasis. (Please see Figure 1 for the overall study design).

The second paper examines the health characteristics of the study sample (i.e., weight status, health behaviors) collected by a cross sectional survey using the Health Questionnaire (Appendix D) and by objective measures of height and weight (Appendix J). This second paper addresses research question 1: What are the general health characteristics of the study sample?

The third paper reflects the qualitative emphasis of this research study and discusses the exploration of the qualitative data that was collected through face to face individual interviews conducted with the children (Appendix E) and with the key informants or parents (Appendix F). Qualitative data were collected by observations conducted by the researcher (Appendix I) using the windshield survey guide by Vollman, Anderrson, and McFarlane (2008). This third paper addresses research question 2: What is the rural context of children participating in this study? ; research question 3: What is the cultural meaning of health (i.e., values, norms, beliefs, behaviors) from the perspectives of a group of preadolescent children?; and research question 4: Is the cultural meaning of health thematically congruent from the perspectives of healthy weight and unhealthy weight children?

**Figure 1. Mixed methods explanatory sequential design: The participant selection model**



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## Paper 1: Considerations when using a mixed-methods explanatory sequential design to discover children's meaning of health

Relationship of Paper 1 to Dissertation

This first paper explored the methodological considerations when using a mixed methods explanatory sequential design to explore the meaning of health in a group of rural children. The paper focused on five particular aspects of the study design (i.e., rationale for mixing, forms of data collection, analytical procedure, organization of design, integration) that were essential in the development and implementation of a rigorous and methodologically sound study. The information presented in this paper illustrates the foundational methodological issues and philosophical underpinnings to consider when exploring health of rural children. Additionally, this paper evaluates this design and discusses the appropriateness of using such a design in this population. This paper was written in APA (2001) format to meet the guidelines of the *Journal of Child Health Care.*

Abstract

Mixed methods research is an approach that enables health professionals to explore and examine the multifaceted questions that arise from childhood obesity, a current complex health issue. Of importance is designing a rigorous methodologically sound study design. Using five criteria for designing a mixed methods study (i.e., rationale for mixing, forms of data collection, analytical procedure, organization of design, and integration) this paper uses an exemplar study to illustrate the decision trail in designing and implementing a mixed methods explanatory sequential design. Using examples from a study on the meaning of health in rural school aged children, this paper outlines the integration of quantitative descriptive data with a focused ethnographic approach, thus providing insights into specific considerations of data collection and analysis in ethnography.

## Introduction

Decades of research in the study of childhood obesity clearly illustrated the extent of this disease (Janssen et al., 2005) and the mutifactoral characteristics of childhood obesity (Lobstein, Baur, Uauy, & IASO International Obesity, 2004). Changing patterns of health behaviors in children have been identified as one of the contributing factors to the current obesity epidemic in children (Anderson & Butcher, 2006). To date, despite the many studies on preventing childhood obesity, the prevalence of this disease remains high and there is a lack of conclusive evidence on the most effective and sustainable approach to prevention. As a result, researchers face the challenge and necessity to continue to develop innovative research approaches that address the complexities surrounding this childhood health issue.

Using an exemplar study, this paper demonstrates the use of a mixed methods design in the exploration of health and health behaviors in children. The mixed methods explanatory sequential study design used in exploring health in a group of rural children is illustrated and examined using the following five criteria that have been as identified as rigorous elements for designing mixed methods studies (Creswell, Fetters & Ivankova, 2004): (a) rationale for mixing, (b) forms of data collection, (c) analytical procedure, (d) organization of design, and (e) integration. It is intended that this paper will discuss methodological issues underlying this particular design and other considerations in designing mixed methods research to study childhood obesity.

*Study Design and Rationale for Mixing*

Recent studies have suggested that the complexity of overweight and obesity warrants the need to adopt a contextual approach in research with children (Krahnstoever Davison, Davison, & Birch, 2001) and one that encompasses the attitudes and values of children that may potentially influence their patterns health behaviors (Galloway, 2007). Additionally, the future need for rigorous quantitative and qualitative approaches was identified as essential in the development of culturally appropriate interventions aimed at obesity prevention (Brunner, Lawson, Pickett, Boyce, & Janssen, 2008; Shaya, Flores, Gbarayor, & Wang, 2008). The purpose of the exemplar study was to discover the meaning of health of preadolescent children living in a rural setting in Saskatchewan. The research questions that guided the study included: (a) What are the general health characteristics (i.e., weight status, patterns of health behaviors) of the study population?, (b) What is the rural context of children participating in the study, (c) What is the cultural meaning of health (i.e., values, norms, beliefs, behaviors) from the perspectives of this group of rural children?, and (d) Is the meaning of health thematically congruent from the perspective of healthy weight and unhealthy weight children? The purpose and research questions of the exemplar study clearly demonstrated the need and benefit of utilizing a mixed methods approach.

Mixed methods research is the collecting, analyzing, and integrating of quantitative and qualitative data in a single study (Creswell & Plano Clark, 2007). A primary assumption of using this approach is that the use of a qualitative or quantitative method in isolation is insufficient in understanding the research issue and that the mixing of the methods results in a more comprehensive understanding of the research problem

(Creswell & Plano Clark, 2007). For example, in the present study quantitative methods provided descriptions of specific health behaviors and the prevalence of overweight/obesity of this population. The qualitative data added depth to the study by exploring the overall context of children's interactions and discovering the cultural meaning that children connected to their described health and health behaviors.

As a paradigm, mixed methods research has emerged from the decades of debates on the compatibility of combining worldviews. Of the three main stances related to paradigms and mixed methods research (See Table 1) pragmatism has been identified as a suitable philosophical partner for mixed methods research (Johnson & Onwunegbuzie, 2004). The characteristics of pragmatism have been viewed as beneficial in addressing the complex questions arising in research of family and community health (Andrew & Halcomb, 2006) and would similarly be suitable for the present study that addresses intricacies of children's health and health behaviors. Additionally, the value that pragmatism places on the physical, social, and cultural context is highly congruent with the overall purpose of the exemplar study.

Table 1

Alternative Stances Relating to Paradigms and Mixed Method Studies

| Stances | Characteristics |
|---|---|
| **1) A-paradigmatic** | - mixed methods research is viewed strictly as a method<br>- methods and paradigms independent, thus the epistemology-methods link unnecessary and distracting<br>- embrace multiple paradigms based on need of particular research study |
| **2) Single paradigm or pragmatism** | - a single paradigm should serve as a foundation for mixed methods research<br>- research question should dictate the methods<br>- reject incompatibility premise and value pluralism<br>- recognition of the existence and importance of the physical, social, and cultural context<br>- researchers should have choice in conducting studies which includes variety of data collection and data analysis |
| **3) Dialectic paradigm** | - purposeful engagement of multiple paradigms and assumptions<br>- contradictory features of paradigms are honored but cannot be reconciled<br>- all ways of knowing contribute to an enhanced understanding thus each paradigm offering a partial world view |

*Note.* Adapted from Creswell and Plano Clark (2007); Johnson and Onwuegbuzie (2004); Tashikorri and Teddie (2003)

Creswell and Plano Clark (2007) identified four major types of mixed methods designs: triangulation, embedded, explanatory, and exploratory. Each design is unique in terms of variants, timing, weighting, integration, and strengths, and challenges (See Table 2) (Creswell & Plano Clark, 2007).

Table 2

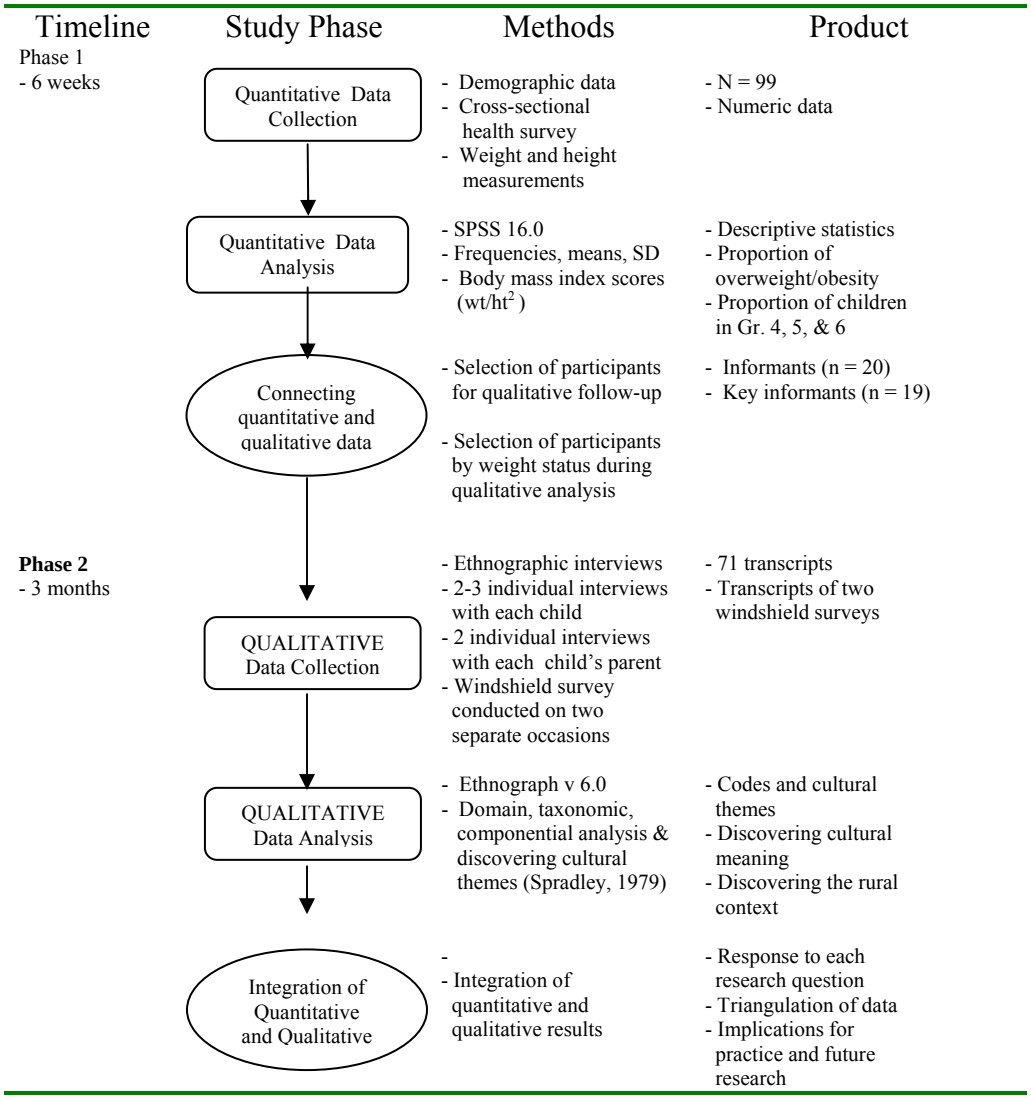
Variants of Mixed Methods Designs

| Design Type | Variants | Timing | Weighting | Integration | Main Strengths/Challenges |
|---|---|---|---|---|---|
| **Triangulation** | - Convergence<br>- Data transformation<br>- Validating quantitative data | - Concurrent (qualitative and quantitative simultaneously) | - Usually equal | - At interpretation or analysis phase | - Efficient design as both data are collected during one phase<br>- challenges with converging different data sets and with procedures to transform data |
| **Embedded** | -Experimental<br>Correlational | - Concurrent or sequential | - Unequal | - Embed one type of data within a larger study which is using the other type of data | - time and resource efficient as one data type is typically given less priority<br>- challenging to integrated the results as each method is typically used to answer different research questions |
| **Explanatory** | - Follow-up explanations<br>- Participant selection model | - Sequential:<br><br>- Quantitative followed by qualitative | - Unequal;<br><br>- Influenced by research questions and goals of the study | - Connect the data between the two phases | - Straightforward to describe, implement and report<br>- Takes considerable time to implement which may increase cost and resources |
| **Exploratory** | - Instrument development<br><br>- Taxonomy development | - Sequential;<br><br>- Qualitative followed by quantitative | - Unequal;<br><br>- Usually quantitative<br><br>- Usually qualitative | - Connect the data between the two phases | - Straightforward to describe, implement and report<br>-Takes considerable time to implement which may increase cost and resources |

*Note.* Adapted from Creswell and Plano Clark (2007), and Tashakorri and Teddie (2003)

The design chosen for the exemplar study was the explanatory sequential design: participant selection model described by Creswell & Plano Clark (2007). This model is a two-phase mixed methods design that begins with the collection and analysis of quantitative data followed by the collection and analysis of qualitative data (Creswell & Plano Clark, 2007) (See Figure 1).

Figure 1. Visual model for mixed-methods explanatory sequential design study (Qualitative emphasis)




*Note.* Adapted from Ivankova, Creswell, Stick (2006)

The qualitative component of the study is used to explain or build upon the results of the preliminary quantitative data (Creswell & Plano Clark, 2007). The participant selection model, a variant of the explanatory model, is used when quantitative data is required to identify and purposefully select participants for in-depth qualitative follow-up (Creswell & Plano Clark, 2007). In the exemplar study, following ethical approval from the participating university, the quantitative data were collected in a cross sectional survey approach to identify children's age/grade, and describe patterns of physical activity, patterns of sedentary behaviors, dietary habits, weight status, and health status. Children were then selected by age/grade to participate in the qualitative interviews. Subsequently, children were also selected by weight status (healthy weight and unhealthy weight) in the analysis of the qualitative data so as to specifically address the research question: Is the meaning of health thematically congruent from the perspective of healthy weight and unhealthy weight children?

*Forms of Data Collection and Analytical Procedure*

In the exemplar study, both quantitative and qualitative methods were used to collect data from the children, the parents, and researcher observations.

*Quantitative Data*

Quantitative data were collected by two methods. A health questionnaire was sent through the school to the homes of children to be completed by the child and parent. The information was used to describe the health and health behaviors of the children in Grades 1 to 7. Additionally, height and weight measurements were collected by the researcher and were used to determine the weight status of the study sample (i.e., healthy weight or unhealthy weight). The health questionnaire used in the exemplar study was

based on portions of the 1997-1998 Health Behavior in School-Aged Children Survey (HBSC) developed by the World Health Organization (2007) which related to physical activity, diet, and sedentary activity. Reliability and validity of the dietary and activity portions of the HBSC survey were established with previous studies (Booth, Okely, & Bauman, 2001; Vereecken & Maes, 2003). Additional questions relating to the rural environment were specifically developed for the exemplar study and were added to the questionnaire. A pilot test of the entire questionnaire took place prior to the commencement of the study.

Height and weight measurements were collected using the procedures suggested by Cole and Rolland-Cachera (2002). Heights, measured with a stadiometer, and weights, measured by a digital scale, were collected twice, averaged and recorded to the nearest 0.1 cm or kg. The final height and weight measurements were used to calculate a BMI or a body mass index score [weight (kg)/height$(m)^2$] for each child. Using the international standards for childhood obesity (Cole, 2000), children were classified by their body mass index score as a healthy weight or an unhealthy weight (overweight or obese).

*Qualitative Data*

The qualitative data for this study was collected from individual face to face interviews with children and with parents and through a windshield survey (i.e., observational assessment of the environment) conducted by the researcher. The two decisions relating to the qualitative component of the exemplar study included selecting the method of qualitative inquiry and identifying the criteria for the selection of participants for follow-up interviews.

*Method of qualitative inquiry*. While the various methodologies of qualitative inquiry share the overall purpose of exploring reality from the emic or insiders perspective differences in approaches influence the type of questions asked and the nature of data collected (Morse & Field, 1995). Selecting an appropriate qualitative approach requires congruence between the purpose of the qualitative methodology and the purpose of the research study. The choice of the qualitative approach for the exemplar study was a focused ethnographic approach. Ethnography, or the study of culture, seeks to understand the meanings of the actions, events, and symbols from the native's point of view (Spradley, 1979). Consistent with the overall purpose of ethnography, the aim of the qualitative component of the exemplar study was to explore the cultural meaning of health in a group of preadolescent children. Previous studies have explored the role of culture in studies of children with diseases and illnesses such as diabetes (Herman, 2006), cancer (Aarnodt, 1986), and SARS or severe acute respiratory system (Koller, 2006). These studies have discovered how aspects of health and illness are perceived from the child's perspective and how this information may impact the care of these populations. In the exemplar, study gaining a better understanding of the role that culture plays in the health of the group of rural children may contribute to the overall body of knowledge of children's health and provide direction for practice in promoting health and healthy weights in this aggregate.

Using an ethnographic approach in the present study individual interviews were conducted in a private room in the school during school hours. Children were typically interviewed twice and each interview lasted a maximum of 20 minutes. An interview guide based on the ecological framework was used to explore intrapersonal factors (e.g.,

What do you do to be healthy?), interpersonal factors (e.g., Who are the people who help you be healthy?), and societal factors (e.g., What are things in school or the community that influence your health?) that may influence children's meaning of health (Glanz, Rimer, Lewis, 2002) The interview questions were modified according to the emerging issues and content of the interview.

In qualitative research, key informants are used as sources of information about experiences, events, or subgroups that the researcher has not or is unable to access or experience (Patton, 2002). In the exemplar study, the children's parents were chosen as key informants. Parents participated in a 30-minute interview that used a similar process and interview guide to that of the children. A total of 71 interviews were conducted (39 child & 32 parents) over a period of approximately three months. Each child and parent was given an opportunity to confirm the findings and interpretations of the researcher within their second or third interviews. These member checks established credibility of the data and enhanced the trustworthiness of the findings (Lincoln & Guba, 1985).

All interviews were audio taped and transcribed verbatim. The transcripts were coded using Ethnograph V6.0. Analysis and data collection followed the cyclic process that enabled the researcher to discover questions for subsequent interviews and uncover the cultural meanings as this process progressed (Spradly, 1979). The four stages of analysis included: a) domain analysis, or using semantic relationships to generate categories of data or to isolate fundamental units of cultural knowledge in which informants organized what they know b) taxonomic analysis, identifying the internal structure of the domains c) componential analysis or the analysis of attributes and

components of meaning and d) discovering cultural themes or conveying a sense of the whole (Spradley, 1974).

Qualitative data was also collected through a windshield survey. This survey followed the guidelines suggested by Vollman, Anderson, and McFarlane (2008) and included assessment of physical spaces (e.g., open spaces, recreational facilities, walking paths, convenience stores, restaurants, supermarkets), and social aspects (meeting places, communication patterns) of the community in which the children interact. The data was collected through observation on two occasions at different times of the day. The data was audio taped as the researcher drove through the community and transcribed verbatim. Overall, this study has used the children's perspectives, parent's perspectives, and data from the windshield survey to describe and interpret the environment in which children interact.

*Selection of participants*. In the explanatory sequential participant selection model, the researcher must identify the criteria used for the selection of participants for the subsequent qualitative component of the study (Creswell & Plano Clark, 2007). These authors suggest several potential criteria, such as demographic characteristics, comparison groups used in the quantitative component, or individuals that vary on particular characteristics. Of particular interest in this study was to explore the cultural meaning of health from the perspectives of preadolescent children. The eligibility criteria for the qualitative phase of the study therefore included attending Grade 4, 5, or 6, having completed the quantitative component of the study, and having at least one parent who agreed to be interviewed. This information was obtained from the completed health questionnaires that were returned from all student respondents in Grades 1 to 7.

Of the 51 preadolescent children in Grades 4 (n = 8), Grade 5 ( n = 21), and Grade 6 (n = 22) who returned completed questionnaires, 30 children and their parents agreed to be contacted for qualitative follow up. At this point, a decision was required on which sampling strategy to use to select a sample of children for interviewing. Sandelowski (2000) suggests that while differences in purposeful and probability sampling exist, these techniques can be combined successfully within one study. For this study, stratified random purposeful sampling was used to select children for individual interviews. Although the stratified purposeful sampling method may be statistically non-representative, it is informationally representative (Sandelowski, 2000; Trost, 1986). In this approach to sampling potentially information-rich cases are chosen on preselected parameters, with each case representing a combination of identified variables (Sandelowski, 2000). A priority in this study was to elicit in-depth information from preadolescent children or children from across all three Grade levels (Grades 4, 5, & 6). The 30 children who agreed to be interviewed were first stratified by Grade level, assigned a case number, and then randomly chosen to participate in the interviews.

Interviewing continued until the point of saturation or the point when the same experiences and descriptions were being heard repeatedly and each new conversation added less and less to what was already known (Rubin, & Rubin, 2005). Saturation was reached with 20 child informants in Grade 4 (n = 5), Grade 5 (n = 7) and Grade 6 (n = 8). This group of informants included nine boys and eleven girls whose age ranged from approximately 9.5 to 12.5 years (M = 10.82, SD = .877). Nineteen parents were interviewed as key informants for the purpose of enhancing our understandings of the children's experiences.

*Organization of the Design*

The two characteristics of mixed methods studies that require design decisions prior to the implementation of the overall study are the priority placed on methods used and the timing of the research phases (Creswell & Plano Clark, 2007). The decision of priority begins by selecting the data collection method that best meets the main goal of the research study (Morgan, 1998). Subsequently, the complementary method of data collection is one that adds to the ability to meet the overall study aims. In the exemplar study, the purpose of the study was to understand the meaning of health from the perspectives of children. As qualitative inquiry usually addresses questions relating to lived experiences and discovers and explores these experiences from the perspectives of the participants in their natural setting (Morse & Field, 1995), it was appropriate to adopt the qualitative method as the primary method in the exemplar study. The quantitative data in this study provided complementary information on the overall health characteristics and the weight status of the study sample.

The timing or the implementation of the research methods refers to the sequence the data are collected, analyzed, and interpreted (Creswell & Plano Clark, 2007). Morgan (1998) suggests that the timing decision may best be addressed by considering if the complementary method bests suits the aims of study as preliminary input to the central method or as follow up to the central method (Morgan, 1998). In the exemplar study the quantitative data informed the qualitative data and was therefore collected prior to the qualitative data. Furthermore, the analysis of the quantitative data was also conducted prior to the analysis of the qualitative data in order to address the research questions of

the study that related to the meaning of health and children's weight status. The main focus of the study was on the qualitative explanatory component.

*Integration of Quantitative and Qualitative*

In a mixed methods study, integration includes decisions of when and how to mix the quantitative and qualitative methods (Creswell & Plano Clark, 2007). These decisions rest on the previous decisions made regarding the purpose, aims, and emphasis of the study. Integration can occur during the development of the purpose and aims of the study, during the data collection phases, and/or in the analysis, interpretation, and discussion of findings (Creswell & Plano Clark, 2007; Tashakkori & Teddie, 2003). In the exemplar study, the integration of the methods occurred at two stages in the study. Initially the purpose of the study and the accompanied research questions clearly directed the need for integrating quantitative and qualitative data. The methods were connected by selecting participants for qualitative follow up based on their grade level and completed quantitative data (i.e., health questionnaire and BMI). Additionally, the methods were also connected in the analysis stage of the study, where weight status of children (i.e., healthy weight vs unhealthy weight) was required for the analysis qualitative responses.

*Study Findings*

The findings of the exemplar study illustrated the value and success of utilizing a mixed methods approach in addressing the complex questions associated with this area of study. Although detailed findings are reported elsewhere, the overall study findings suggested that the prevalence of overweight and obesity in this rural population was high (34%) with a significantly higher prevalence of overweight and obesity in boys compared to girls. The preadolescent children (Grades 4, 5, 6) in the study described their meaning

of health as multidimensional with a cognitive (*Knowing Stuff*), a physical (*Having a Working Body*) and a psychosocial (*Feeling Happy*) dimension. Of these dimensions children explained that *Feeling Happy* was the most meaningful to their health and that feeling encouraged and supported contributed to their happiness and health. In this sample of children, the meaning of health was congruent between children of healthy weight and those of unhealthy weight and between boys and girls. Additionally, the majority of children (i.e., both healthy weight and unhealthy weight) described themselves as healthy. The descriptions of the children and parents were integrated with the observations of the rural environment and overall it was discovered that the rural environment was valued by both children and parents and appeared to provide a sense of security, safety, and freedom to this group of children.

The findings illustrate the depth of understanding obtained with the integration of quantitative and qualitative data within a single study. Advantageous of this type of study is also the generation of additional complex questions that guide future research and programs of study.

*Conclusion*

The recognized complexity of childhood obesity necessitates the need to conduct rigorous research that acknowledges and addresses these complexities effectively. While qualitative approaches are valuable in exploring lived experiences and quantitative approaches important in describing measurable attributes, mixed method approaches include the ability to answer confirmatory and exploratory questions in the same study thus answering research questions that other methodologies cannot (Tashakkori & Teddie, 2003). Using five design criteria for mixed methods studies this paper provided

an example of a study that used quantitative (i.e., health questionnaire & BMI scores) and qualitative (i.e., focused ethnography & windshield survey) approaches in examining and exploring health and health behaviors in rural children.

In addition as this research process unfolded, both the strengths and limitations of utilizing a sequential mixed methods design with this study population became evident. In this study the sequential design was found to be particularly beneficial because: a) this design is manageable for one researcher to conduct, b) the extended period of time between the collection quantitative and qualitative data decreased potential for the quantitative responses to influence the interview discussions, and c) the researcher was able to ensure the quantitative data (i.e., height and weight measures) was complete prior to the collection of the qualitative data. While the sequential design has the advantage of a straightforward structure, the time and resources required to implement the multiphase design might be a disadvantage (Creswell & Plano Clark, 2007). As illustrated in Figure 1, the present study took place over a period of approximately four and a half months. Although organizational issues and the required ongoing commitment of the school staff and study informants may be challenging, this extended period of time was also advantageous in providing multiple opportunities to build rapport and relationships with the children, parents, and school community.

Although this paper illustrated the sequential mixed methods design (participant selection model), using the five criteria identified by Creswell et al., (2004) (i.e., rationale for mixing, forms of data collection, analytical procedure, organization of design, and integration), these elements are useful in designing other types of mixed methods studies such as the triangulations design or the embedded design. Additionally, this paper

demonstrated the ability to implement this research design in a school setting with preadolescent children. While the extended length of time required to conduct a sequential mixed methods study is viewed as a disadvantage, with this study sample this design was advantageous. The extended period of time (i.e., approximately 4 months) provided an opportunity to build relationships and trust with the young study participants, their parents, and the school community that is an essential component when collecting qualitative data. Furthermore, this study design provided appropriate intervals of time between the collection of quantitative data and qualitative data, and between the two face to face interviews with children and with parents. With the intervals of time between periods of data collection, the children in particular did not get overburdened with participating in demanding or lengthy methods of data collection.

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## Paper 2: Weight Status and Health Characteristics of Rural Saskatchewan Children

Relationship of Paper 2 to Dissertation

In the mixed methods explanatory design (participant-selection model), the researcher requires specific quantitative information to identify and select participants for subsequent in-depth qualitative follow-up. The quantitative results described in the following paper were used to select children by age/grade to participate in qualitative interviews (i.e., Grade 4, 5, & 6 children who agreed to be interviewed) and to select children by weight status (i.e., healthy weight and unhealthy weight) in the analysis of children's meaning of health. Additionally, the results described in this quantitative paper provided a descriptive context of the health behaviors of this group of children that was used in the overall description of this study population. This paper addressed the first research question: What are the general heath characteristics of the study population?

This paper was written in a format (i.e., Uniform Requirements) that meets the guidelines of the *Canadian Journal of Public Health*.

Abstract

**Background:** Previous studies suggest a similar or higher prevalence of overweight in rural children compared to urban. There are limited data on the weight status and behaviors of children in rural settings. The purpose of this study was to examine health behaviors and weight status of children aged 8 to 13 yrs living in rural Saskatchewan.

**Methods:** A cross sectional health questionnaire assessed the health behaviors (e.g., physical activity, sedentary behaviors, dietary patterns) of children attending a rural school. Heights and weights were measured for 97 children. BMI's ($wt/ht^2$) was calculated and used to categorize children as healthy weight, overweight, or obese.

**Results:** Thirty four percent of children were overweight (23.7%) or obese (10.3%) with a significantly higher prevalence of overweight/obesity in boys aged 6 to 8 yrs compared to girls ($p < 0.05$). Many children (52.6%) reported watching $\geq$ 2 hrs television daily with a significantly higher proportion of children living in town (versus living on a farm) watching $\geq$ 2 hrs of TV daily ($p < 0.05$). Many children commuted to after school activities (70%) or to school by bus (25.0%) or car (40.0%). Most children reported eating healthy foods (e.g., fruits and vegetables) more frequently and unhealthy foods (e.g., sugared drinks and french fries) less frequently.

**Conclusion:** Prevalence of overweight/obesity in these rural children was high with gender differences evident at a very young age. Understanding factors that may contribute to unhealthy weights of rural children may assist in the development of effective health promotion programs for rural children.

**MeSH terms:** Child, overweight, obesity, rural health, health behavior, health status

## Introduction

The prevalence of childhood overweight and obesity in the Canadian population has increased remarkably compared to child populations in other countries [1]. In Canada, the rate of increase in obesity has been greater in children than in adults [2] and in rural youth populations compared to urban [3]. While evidence clearly suggests that overweight and obesity is of growing concern for all Canadians, it may be an even greater concern for youth and for those living in rural areas.

Changes in patterns of behaviors, such as physical activity, sedentary behavior, and dietary practices have been found to contribute to the rise in childhood obesity[4]. Recent national studies have reported that 26% of Canadian children (aged 2 -17 yrs) are classified as overweight[5] and many Canadian children are not meeting the national guidelines for physical activity[6], are engaged in too much screen time[6], and are not eating the recommended servings of dairy, fruits, or vegetables[7]. There is limited data on the health behaviors of preadolescent children living in Saskatchewan, particularly of those children living in rural settings. Of the ten Canadian provinces, Saskatchewan ranks fifth in the prevalence of childhood obesity, with 29% of children (aged 2-17 yrs) classified as overweight[5]. A similar proportion (28.8%) of children living in rural Saskatchewan have been classified as overweight or obese [8]. Studies examining the physical activity patterns of children (aged 8 – 13 yrs) living in rural Saskatchewan have reported that many children (46.3%) were not physically active enough for health benefits[9] and that children living in rural Saskatchewan settings are less aerobically fit than children living in urban settings in the province[10]. A study conducted with Saskatchewan rural youth in Grades 7 to 12 reported that most youth watched between one and two hours of television daily,

consumed less than the recommended amounts of fruits and vegetables, and few were active for a minimum of one hour every day[11]. To guide and tailor interventions and health promotion strategies further research is needed on the health characteristics of preadolescent children living in rural areas and on potential factors that may influence their patterns of behavior. The purpose of this study was to explore the health behaviors and weight status of a group of rural preadolescent children living in central Saskatchewan.

## Methods

The present study was a mixed methods study that used qualitative methods (i.e., individual interviews, researcher observation) to explore the meaning of health and quantitative methods (i.e., health questionnaire, anthropomethric measures) to examine weight status and health behaviors of a group of preadolescent children living in rural Saskatchewan. This paper will report the quantitative findings (i.e., weight status, physical activity, sedentary behavior, dietary patterns) of the study that were collected prior to the qualitative component of the study.

This cross-sectional portion of the overall study was conducted between February and June, 2008 in an agriculturally based rural town (pop. 1,743) in central Saskatchewan located approximately 100 km from the nearest urban center. The study was approved by the University of Saskatchewan's Behavioral Research and Ethics Board and by the Director of Education and principal of the participating school. All children in Grades 1 to 7 (N = 194) were invited to participate in the study and were recruited through short classroom presentations conducted by the researcher. Of the 194 questionnaires

distributed through the classrooms, 99 were returned completed for a response rate of 51.0%.

A cross-sectional health questionnaire based on portions of the Health Behavior in School Aged Children (HBSC) Survey (1997-1998)[12] was used to gather information on children's physical activity, sedentary behaviors, dietary patterns, and perceptions of health status. In particular, sedentary behaviors were measured by self-reported hours of screen time (e.g., watching television, using a computer for games or other activities), and time spent commuting by car or bus to school or other activities. Children's physical activity patterns were assessed by self-reported frequency of their participation in organized (e.g., volleyball, football, soccer, swimming), unorganized (e.g., biking, pick-up sports games, rollerblading), or class like activities (e.g., gymnastics, karate, dance). The HBSC questionnaire was developed by an international research network of multidisciplinary experts and used to gather information on health and health behaviors of youth aged 11-15 yrs[12]. Reliability and validity of the dietary and activity portions of the HBSC survey were established with previous studies[13,14]. Additional questions relating to the rural environment were specifically developed for the present study. A pilot test of the entire questionnaire took place prior to the commencement of the study. Students completed the questionnaire at home with their parent or guardian and returned it in a sealed envelope to a designated container in their classroom.

Height and weight measurements of each child were collected by the researcher. Measurements followed the procedures suggested by Cole & Rolland-Cachera [15] . The children were asked to remove shoes or any heavy clothing such as a jacket or sweater. Height was measured twice to the nearest 0.1 cm using a standardized stadiometer.

Weight was measured twice to the nearest 0.1 kg using a digital scale. The two measurements of heights and weights were averaged and recorded to the nearest 0.1 cm or kg. The final height and weight measurements were used to calculate a body mass index score [weight (kg)/height(m)$^2$] for each child. Using the international standards for childhood obesity[16], children were classified by their body mass index score as a healthy weight or an unhealthy weight (overweight or obese).

All data from the questionnaire was cleaned, entered, and analyzed using the SPSS 16.0. Categorical variables (e.g., age, gender, grade, etc.) were analyzed descriptively using frequency distributions, percentages, and measures of central tendency. The chi square test was used to examine distributions of variables across grade level, and between boys and girls and town and farm residents. Statistical significance was indicated with a $p \leq 0.05$.

## Results

In this sample, 34.0 % of children were categorized as either overweight (23.7%) or obese (10.3%) (See Table 1). Overall, 42.9 percent of boys were overweight (28.7%) or obese (14.3%) and 25 percent of the girls were overweight (18.8%) or obese (6.2%).

A significantly higher proportion of boys aged 6 to 8 yrs were categorized as unhealthy weights compared to girls of the same age [$\chi^2$ (1, $\underline{N}$ = 34) = 6.2, $\underline{p}$ = 0.046]. There was a tendency for the proportion of unhealthy weights to increase by grade (see Figure 1). Interestingly, regardless of weight status, the majority of children (99.9%) reported that they were quite healthy or very healthy.

**TABLE 1**

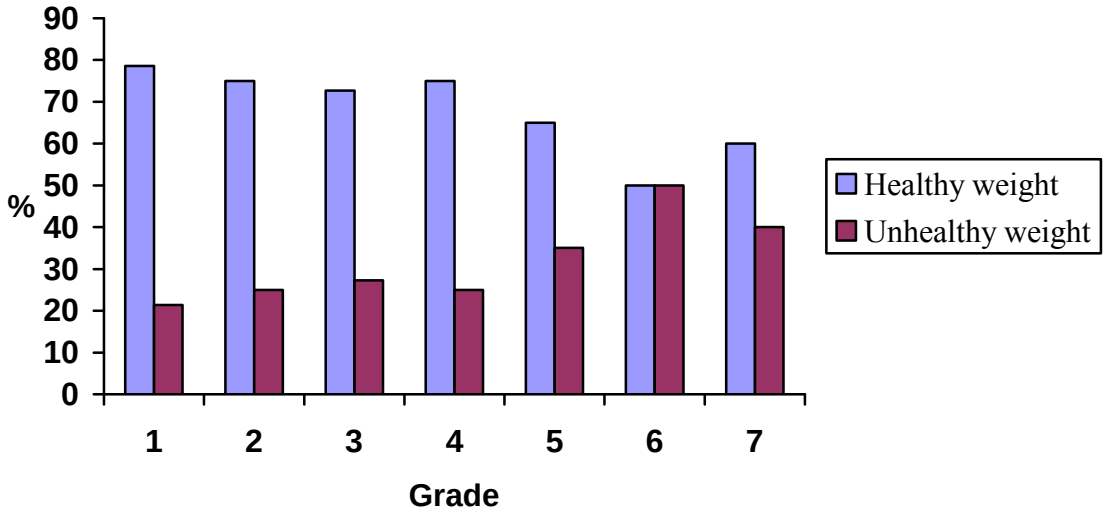
**Health Characteristics of Children By Gender**

| Characteristic | Boys | | Girls | | All | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Weight Status* | | | | | | |
| Healthy weight | 28 | 57.1 | 36 | 75.0 | 64 | 65.9 |
| Unhealthy weight | 21 | 42.9* | 12 | 25.0 | 33 | 34.0 |
| Television watching* | | | | | | |
| ≤ 1 hour/day | 22 | 44.0 | 24 | 51.1 | 46 | 47.4 |
| ≥ 2 or more hours/day | 28 | 56.0 | 23 | 48.9 | 51 | 52.6 |
| Computer games†§ | | | | | | |
| ≤ 3 hrs/wk | 28 | 57.1 | 36 | 76.6 | 64 | 66.7 |
| ≥ 4 or more hrs/wk | 21 | 42.9 | 11 | 23.4 | 32 | 33.3 |
| Unorganized sports† | | | | | | |
| 1x mo. or rarely | 4 | 8.2 | 10 | 21.3 | 14 | 14.6 |
| 1 x a wk or more | 45 | 91.8 | 37 | 78.7 | 82 | 85.4 |
| Organized sports†‖ | | | | | | |
| 1x mo. or rarely | 6 | 12.2 | 14 | 29.8 | 20 | 20.8 |
| 1 x a wk or more | 43 | 87.8 | 33 | 70.2 | 76 | 79.2 |
| Class activities†¶ | | | | | | |
| 1x mo. or rarely | 35 | 71.4 | 13 | 27.7 | 48 | 50.0 |
| 1 x a wk or more | 14 | 28.6 | 34 | 72.3 | 48 | 50.0 |
| Eating vegetables‡ | | | | | | |
| ≤ 1/ week | 21 | 42.0 | 21 | 43.8 | 42 | 42.9 |
| ≥ 1/day | 29 | 58.0 | 27 | 56.2 | 56 | 57.1 |
| Eating Fruit‡ | | | | | | |
| ≤ 1/week | 11 | 22.0 | 8 | 16.7 | 19 | 19.4 |
| ≥ 1/day | 39 | 78.0 | 40 | 83.3 | 79 | 80.6 |
| Eating French Fries‡ | | | | | | |
| ≤ 1/week | 31 | 62.0 | 31 | 64.6 | 62 | 63.3 |
| ≥ 1/day | 19 | 38.0 | 17 | 35.4 | 36 | 36.7 |
| Drinking coke/ sugared drinks‡ | | | | | | |
| ≤ 1/week | 41 | 82.0 | 44 | 91.7 | 85 | 86.7 |
| ≥ 1/day | 9 | 18.0 | 4 | 8.3 | 13 | 13.3 |

* Missing data for two children
† Missing data for three children
‡ Missing data for one child
§ Playing computer games by gender [$\chi^2$ (1, N = 96) = 4.08, p = .043]
‖ Participation in organized sports by gender [$\chi^2$ (1, N = 96) = 4.47, p = .034]
¶ Participating in group class activities by gender [$\chi^2$ ( 1, N = 96) = 18.38, p = .00]

Compared to the girls, a significantly higher proportion of boys reported playing computer games for four or more hours a week (See Table 1). Many children (52.6%) reported watching television for two or more hours a day. A significantly higher proportion of children living in town compared to children living on a farm or acreage reported watching two or more hours of television a day [$\chi^2$ (1, N = 97) = 5.28, p = .021]. There were no significant differences between place of residence and time spent using a computer for games or other activities.

Figure 1 Proportion of healthy weight and unhealthy weight children by grade




Twenty five percent (n = 27) of the children commuted to school daily by school bus reporting a minimum mean time of 29.5 minutes (*SD* = 16.2) traveling one way to or from school. Additionally, 40% of the children reported spending a relatively short time being driven to (*M* = 4.2 minutes, SD = 3.9) or from school most days of the week. The majority of children (70%) reported being driven to other activities (e.g., sports, clubs,

visit friends), spending a minimum mean time of 23.8 minutes (*SD* = 34.8) traveling one way to or from activities on a weekly basis.

A significantly greater proportion of boys participated in organized sports while a significantly greater proportion of girls participated in classes like activities (See Table 1). Although not statistically significant, there appeared to be a trend for a higher prevalence of boys participating in unorganized sports compared to girls. There were no significant differences between participation in organized, unorganized or class-like activities and living in a town or on a farm.

## Discussion

Study results show that 34.0% of all children responding to the survey were either overweight (23.7%) or obese (10.3%). While direct comparisons with other studies of our findings for the prevalence of obesity are difficult due to differences in methodologies and populations, these findings are a slightly higher than a regional study of 504 children conducted in rural Ontario, Canada where 28.6% of children were classified as overweight (17.7%) or obese (10.9%)[17]. The Canadian Community Health Survey, which used measured heights and weights of 8,661 children aged 2 to 17 yrs, reported 28.8% of children living in rural Saskatchewan as overweight or obese[8]. A study conducted in the United States with 3,416 rural and urban children aged 8 – 12 yrs reported 46.9% of rural children were at risk for overweight (21.8%) or overweight (25.1%)[18], with the terms 'at risk for overweight' and 'overweight' corresponding to the Canadian terms of overweight and obese respectively[19].

This study found a significantly higher prevalence of overweight and obesity in boys aged 6 to 8 years of aged compared to girls of the same age. A study conducted in

rural Ontario reported a similar gender difference with a significantly greater prevalence of obesity (i.e., but not overweight) in boys (15.0%) aged 7 and 10 years of age compared to similar aged girls (6.8%)[17]. Inconsistent with these studies, are studies of rural children living in the United States [18] and of urban children living in Canada [20] that report no significant gender differences in the prevalence of overweight and obesity. Further research is needed to more clearly distinguish if gender differences in prevalence of overweight or obesity in rural children exists. Should gender differences exist, further exploration on the potential reasons for differences may provide valuable information for the development of health promotion programs tailored specifically by gender.

National recommendations suggest that children and youth spend two hours a day or less watching television[21]. Only 47.4% of children in the present study met this recommended guideline. This finding is similar to other studies of Canadian children that have reported 44% of children in Grades 6 to 12 [22] and 36% and 33% of 11-year old boys and girls respectively reported meeting the recommended guideline for television watching [23]. A study of 954 rural high school students (Grades 7 – 12) reported that 53.7% of youth watched between one and two hours of television on an average school day [11].

Interestingly, in the present study, place of residence (i.e., living in town) was significantly associated with more hours of television watching. There is limited research that examines and compares the patterns of behaviors between farm and non-farm rural residents, particularly with rural children. One study that compared cardiovascular risk factors between farm and non-farm rural women reported a higher prevalence of smoking in non-farm rural residents but a higher prevalence of obesity and hypertension in farm

residents [24]. As in the present study, this study suggested that differences in behaviors may exist between farm and non-farm rural residents. Further exploration of these aggregates may reveal variations in these populations that require specific approaches to health promotion and intervention strategies.

Children in this study were involved in inactive transportation (e.g., transported by vehicle to and from activities). Many children reported being driven to school (40%), to activities (70%) and/or riding a school bus (25%) on a regular basis. The use of inactive transportation in this rural setting results in children potentially accumulating several additional hours a week (i.e., ~ 60 minutes a day to and from school and/or 60 minutes a week to and from extracurricular activities) of sedentary behavior. There are few studies that explore the amount of time rural children spend commuting, however these findings are similar to those found in children in Grades 6 to 12 living in New Brunswick where 77% of children in Grades 6 to 12 reported using inactive modes of transportation (e.g., getting a ride or taking a bus)[22]. Even though some commuting (i.e., busing to school) cannot be avoided in rural settings, decreasing unnecessary commuting may provide additional opportunities for rural children to be active thereby counteracting the necessary commuting in this setting.

The consumption of sugared drinks has been associated with displacing nutrients[25] and the development of overweight and obesity in children[26]. The daily intake of sugared drinks in the present study (18% for boys and 8.3 % for girls) is similar to those found in a Canadian study that reported 14% of boys and 10% of girls drank sugared drinks on a daily basis[23]. A study conducted with rural children living in the United States reported that 32.3% of school age children consume nine or more ounces of

soft drinks every day[27]. The finding in the present study suggest that rural children have reasonable access to sugared drinks, thus making a reduction of soft drink consumption a worthy focus of health promotion efforts for rural child populations.

The limitations of this study include the response rate, study design, and data collection tools. Although several strategies were used to improve participation in the study, the low response rate (51.0%) limits generalizability beyond the study sample. While this is a limitation in the quantitative results of this study, these findings provided an overall purposeful context for this mixed methods study in which the main emphasis was on the qualitative component of the study. The two phase study design (i.e., quantitative component followed by a qualitative component with parental involvement) may have deterred some children and parents from participating in the first phase (i.e., quantitative) of the study because of a foreseen need to also participate in the second phase (i.e., qualitative) of the study. Additionally, the health questionnaire was based on the Health Behavior in School Aged Children questionnaire that was designed for adolescents. To address this limitation, children were asked to take the questionnaire home and complete it with a parent or guardian thus decreasing the possibility of children's potential lack of understanding of the questions.

This study responded to the recommendation of Tremblay[28] for the need of more studies using directly measured heights and weight for the assessment of overweight and obesity. Although a contribution of this study was the directly measured heights and weights, a limitation remained in the self-report of the health behaviors. Potential inaccuracies have been reported in proxy and self-report data suggesting that even though these methods provide some benefits (e.g., ease of collection), relying exclusively on

these methods is not recommended[29,30]. In the present study, obtaining objective measures of physical activity, physical inactivity, commuting times, and dietary recalls would add to the accuracy of data and thus our overall understanding of these behaviors.

In summary, the findings suggest that the prevalence of childhood obesity in preadolescent children living in rural Saskatchewan children is high. Additionally, boys may be at higher risk for overweight and obesity than girls and this risk may begin at a very young age. Differences may also exist in the preferences of activities between boys and girls and between the behaviors of children living in town and farm settings. This information may have implications for health promotion or interventions aimed at promoting healthy behaviors and healthy weights for this specific population.

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## Paper 3: The meaning of health in rural school-aged children: A mixed methods approach

Relationship of Paper 3 to Dissertation

The research questions addressed in this paper are as follows: What is the rural context of children participating in this study? What is the cultural meaning of health (i.e., values, norms, beliefs, behaviors) from the perspectives of a group of preadolescent children?, and Is the cultural meaning of health thematically congruent from the perspectives of healthy weight and unhealthy weight children? The findings are placed within our present knowledge base of children's meaning of health and highlights how these findings differ and contribute to this area of study. Lastly, this paper illustrates the value of engaging children in research and demonstrates that children have the knowledge and ability to articulate their meanings of health.

The paper was written in a format recommended for *The Western Journal of Nursing Research* (i.e., APA 5th ed., 2001).

Abstract

Changing patterns of healthy behaviors in children have resulted in an increasing prevalence of overweight and obesity in children, particularly in rural children. This study explored the cultural aspects (i.e., values, beliefs, norms, behaviors) of children's lives that play a key role in guiding children's behaviors and meaning of health. An explanatory sequential mixed methods design (Qualitative emphasis) was selected for the study. A health questionnaire and BMI scores were collected on 99 children in Grades 1 to 7 attending a rural school in central Saskatchewan. Using a focused ethnographic approach, face to face open ended individual interviews were conducted with twenty children (9 to 12 yrs) and their parents for the purpose of gaining a deeper understanding of their cultural meaning of health. Additionally, these meanings were interpreted within the rural context in which the children live and interact. Children described their cultural meaning of health within the three themes of *Knowing Stuff, Having a Working Body*, and *Feeling Happy*. Children explained that of these themes, *Feeling Happy* was most meaningful and that receiving encouragement and support from valued relationships contributed to their happiness and overall meaning of health. The rural environment appeared to provide a sense of safety, security, and freedom in which the children frequently engaged. The findings of this study provide a deeper understanding of: (a) rural children's meaning of health, (b) aspects that foster the meaning of health, and (c) children's experience of their rural surroundings. Health professionals may find these results useful in the development of programs aimed at promoting health and healthy behaviors in rural children.

## Introduction

Childhood, and specifically preadolescence, appears to be a productive period for the development of knowledge, beliefs, and behaviors relating to health (Natapoff, 1978). These factors may all have an impact on children's present health and on their future health as adults. Developing an accurate understanding of children's beliefs of health are necessary for the development of effective and age-appropriate health promotion programs (Piko & Bak, 2006). Presently, an area of children's health that is of particular concern is that of childhood obesity. In the last two decades the prevalence of childhood obesity has increased remarkably with this increase being greater in Canada than in several other countries (Janssen, I., Katzmarzyk, P., Boyce, W., Vereecken, C., Mulvihill, C., Roberts, C. et al.. 2005). In Canada there also appears to be a geographical difference where a higher prevalence of obesity evident in rural children compared to their urban counterparts (Brunner, Lawson, Pickett, Boyce, & Janssen, 2008; Plotnikoff, 2004). Although children's understanding of health has been explored in several countries (Backett & Alexander, 1991; Bird & Podmore, 1990; Boruchovitch & Mednick, 1997; Natapoff, 1978) few studies have been conducted in Canada (Normandeau , Kalnins, Jutras, Hanigan, 1998), and few have been conducted with rural children (Normandeau et al., 1998; Onyango-Ouma, Aagaard-Hansen, & Jensen, 2004; Piko & Bak, 2006). Additionally, despite the excess of interventions aimed at obesity prevention, there still remains limited conclusive evidence on the most effective and sustainable method for preventing overweight and obesity in children (Brown & Summerbell, 2009; Summerbell, Waters, Edmunds, Kelly, Brown, & Campbell, 2005). A strategy that may contribute to developing effective health promotion programs and interventions aimed at

obesity prevention is to design interventions that are congruent with the cultural meaning (values, norms, beliefs, & behaviors) of health in those children who appear to have a high need for such interventions, such as rural Canadian children. The meaning of health is associated with the developed culture that is created within social and environmental contexts (Alexamder & Seidman, 1990; Loustaunau & Sabo, 1997). Culture has been described as a powerful determinant of behavior and is influential in shaping individuals judgments and perceptions (Swartz & Jordan,1980). Thus, it is important to increase our understanding of children's cultural meaning of health and use this understanding as a foundation for the development of future interventions.

## Purpose

The purpose of this study was to explore the meaning of health in a group preadolescent children living in rural Saskatchewan. The research questions were: (a) What is the rural context of children participating in the study?, (b) What is the meaning of health (i.e., values, norms, beliefs, behaviors) from the perspective of this group of rural children? (c) Is the meaning of health thematically congruent from the perspective of healthy weight and unhealthy weight children?

## Background

Studies exploring the meaning of health from the perspectives of rural children are limited and were conducted with rural children (aged 5 – 15 yrs) living in Hungary (Piko & Bak, 2006), Kenya (Omyango-Ouma et al., 2004) and Canada (Normandeau, et al., 1998). These studies which collected data through interviews (Omyango-Ouma et al. & Normandeau et al.) and the draw and write technique (Piko & Bak, 2006), reported that children were knowledgeable about health behaviors (e.g., eating healthy, physical

activity). Additionally, through the use of content analysis and data transformation techniques, studies reported rural children's view of health as holistic (i.e., physical, social, spiritual, psychological), and/or biomedical (i.e., absence of illness). Although these studies provided valuable underlying knowledge about children's view of health, questions surrounding the rural context and the deeper cultural meaning (i.e., values, beliefs, norms, behaviors) of health and health behaviors from the perspective of rural children remains unanswered.

## Methods

### *Study Design*

A mixed methods approach using the explanatory sequential design with a participant selection model proposed by Creswell & Plano Clark (2007) was used to gain a deeper understanding of the cultural meaning of health of a sample of rural preadolescent children. The quantitative component of the study was descriptive and included a standardized questionnaire and anthropometirc measurements. This data were collected first and were used to: (a) select preadolescent children attending Grades 4, 5 and 6, (b) identify those child-parent dyads who agreed on the questionnaire to qualitative follow-up, (c) identify children by weight status (healthy weight and unhealthy weight), and (d) describe the overall health characteristics of the study sample. In the qualitative component of the study, a focused ethnographic approach was used to gain a deeper understanding of the cultural meaning of health described by this group of preadolescent children. Data were collected through face to face, open-ended individual interviews with children and with their parents and through a windshield survey of the environment conducted by the researcher. Children's parent's were used as key informants and were

individually interviewed for the purpose of enhancing our understanding of the children's experiences (Patton, 2002). Key informants have the ability to enhance understanding because their direct access to a particular setting or subgroup in the population under study for which the researcher has considerably less contact (Patton, 2002). In this study, the parents provided knowledge and insights that were used to develop a "composite picture" (LeCompte & Schensul, 1999) of their children's experiences about health. A windshield survey, or an observational method of assessing a community (Vollman, Anderson, & McFarlane, 2008), was used by the researcher for the purpose of gaining a greater understanding of the rural context in which the study participants construct their meaning of health.

*Setting*

The study was conducted in an elementary school located within a rural town (pop. 1,743 persons) in central Saskatchewan. The town is located approximately100 km from the nearest city. The school is the only elementary school within the community and was adjacent to the only high school in the community. The total enrollment for the elementary school was 194 students from Grades 1 to 7. All children spoke English and lived in the town or the surrounding area.

*Sample*

This study was approved by the University of Saskatchewan's Behavioral Research Ethics Board and by the Director of Education and principal of the participating school. After approval was obtained, the researcher recruited study participants through short classroom presentations. Following the presentations each student was invited to take home the study package (information letter, consent form, health questionnaire,

return envelope) to read and complete with a parent or guardian. There were 194 study packages distributed. A subgroup of those preadolescent children (n = 96) attending Grades 4, 5 or 6 was invited to participate in the qualitative component of the study. Eligibility for the qualitative study required participation in the quantitative study including height and weight measurement, having at least one parent who agreed to participate in individual interview, and provision of a signed consent/assent for participation in the individual interview.

*Data Collection*

Using quantitative and qualitative methods, data were collected from the children, from the parents, and through researcher observations.

*Health questionnaire*. A cross-sectional health questionnaire based on portions of the Health Behavior in School Aged Children (HBSC) Survey (1997-1998) was used to gather information on children's physical activity, sedentary behaviors, dietary pattern, and perceptions of health status (WHO, 2007). There were 17 questions in the questionnaire and it took approximately 10 minutes to complete.

*Anthropometric measurements*. Height and weight measurements of each child were collected by the researcher in a private location in the school. Measurements followed the procedures suggested by Cole & Rolland-Cachera (2002). The children were asked to remove shoes or any heavy clothing such as a jacket or sweater. Height was measured twice to the nearest 0.1 cm using a standardized stadiometer. Weight was measured twice to the nearest 0.1 kg using a digital scale. The two measurements of heights and weights were averaged and recorded to the nearest 0.1 cm or kg. The final height and weight measurements were used to calculate a body mass index score

[weight(kg)/height(m)$^2$] for each child. Using the international standards for childhood obesity (Cole, 2000), children were classified by their body mass index score as a healthy weight or an unhealthy weight (overweight or obese).

*Individual interviews*. In this study ethnographic interviews were used to gain a deeper understanding of the culture (i.e., values, beliefs, norms, behaviors) in which this group of children constructed their overall meaning of health. Data collection and data analysis was an iterative process and followed the developmental research sequence described by Spradley (1979). The questions in the initial interviews were descriptive and used for the purpose of eliciting large amounts of information from the perspective of children in their native language (Spradley, 1997). The analysis of these descriptive questions provided insight into the 'surface structure' of the children's cultural meaning of health, provided a foundation for developing domains, and generated questions for the subsequent interviews. The questions in the second interviews included structural and contrast questions. These questions were used to unravel meaning and discover the internal structure of the domains by eliciting information about the relationships and attributes of the cultural components within the domains. The analysis of the final interviews enabled the discovery of cultural themes that together generated the overall meaning of health for this group of children.

Individual interviews lasted a maximum of 20 minutes and were conducted in a private room in the school during school hours. Of the twenty children interviewed, most children (n = 15) were interviewed twice, two children were interviewed three times, because they were good informants (i.e., articulate and provided detailed information), and three children were interviewed once as final confirmatory interviews (i.e., member

checking to establish credibility of data). The interview guide was based on the ecological framework (Glanz, Rimmer, & Lewis, 2002) which explored intrapersonal factors (e.g., What do you do to be healthy?), interpersonal factors (e.g., Who are the people who help you be healthy?), and societal factors (e.g., What are things in school or the community that influence your health?) that may influence children's meaning of health. The interview questions were modified according to the emerging issues and content of the interview.

Parents participated in a two 30-minute interviews that used a similar process and interview guide to that of their children. Of the seventeen parents interviewed most parents (n = 15) were interviewed twice and two parents were interviewed once as they were unavailable for the second interview. A total of 71 interviews were conducted (39 child interviews & 32 parents interviews) over a period of approximately three months. Each child and parent was given an opportunity to confirm the findings and interpretations of the researcher within their second and third interviews

*Windshield survey*. Of particular importance in studying children, is the need to study children in context (Graue & Walsh, 1998). This study has used the children's perspectives, parent's perspectives, and data from the windshield survey to describe and interpret the physical surroundings in which children interact. The windshield survey followed the guidelines suggested by Vollman, Anderson, and McFarlane (2008) and included an observational assessment of physical spaces (e.g., open spaces, recreational facilities, walking paths, convenience stores, restaurants, supermarkets, health facilities), and social aspects (meeting places, communication patterns) of the community in which

the children interact. The data was collected on two occasions at different times of the day (morning and late afternoon).

*Analysis*

All interviews were audio taped and transcribed verbatim. The transcripts were coded using Ethnograph V6.0. Analysis and data collection followed the cyclic process that enabled the researcher to discover questions for subsequent interviews and uncover the cultural meanings as this process progressed (Spradly, 1979). The four stages of analysis included: (a) domain analysis, or using semantic relationships to generate categories of data or to isolate fundamental units of cultural knowledge in which informants organized what they know; (b) taxonomic analysis, identifying the internal structure of the domains; (c) componential analysis or the analysis of attributes and components of meaning; and (d) discovering cultural themes or conveying a sense of the whole (Spradley, 1979). Trustworthiness of the data was established by using participant words as much as possible, keeping an audit trail, and confirming interpretations of the data with the study participants.

All quantitative data from the questionnaire were cleaned, entered and analyzed using SPSS 16.0. Height and weight measurements were used to calculate BMI scores ($wt/ht^2$) and each child was categorized as a healthy or unhealthy weight.

Analysis continued with the integration of the quantitative and qualitative data. The emerging themes were explored and compared with the health characteristics reported in the questionnaire. The qualitative data was also analyzed from the perspectives of children who were of healthy weight and an unhealthy weight. The data

from the windshield survey was integrated with the qualitative data from the children and parents and was used to portray the rural context in which these children live and interact.

## Findings

### *Sample Characteristics*

Of the 194 questionnaires distributed, 99 questionnaires were returned for an overall response rate of 51.0 percent. The sample of 99 children included 51 boys and 48 girls. Approximately 66 percent of children were categorized as a healthy weight and 34 percent as an unhealthy weight (overweight or obese). Further information about the health characteristics of the overall sample are reported elsewhere.

Fifty one preadolescent children in Grade 4 (n=8), Grade 5 (n=21), and Grade 6 (n=22) returned completed questionnaires. Of these children, 30 children and their parents agreed to participate in the qualitative component of the study. Interviewing continued until the point of saturation or the point when no new information or themes were emerging from the data (Guest, Bunce, & Johnson, 2006). Saturation was reached with 20 informants in Grade 4 (n = 5), Grade 5 (n = 7) and Grade 6 (n = 8) whose age ranged from approximately 9.5 to 12.5 years (M = 10.82, SD = .877). Many informants reported living in this rural district all their lives (M = 9 yrs, SD = 3.6 yrs). The majority of all 20 children reported that they thought they were either quite healthy (78.9%) or very healthy (21.0%). In this sample of 20 children, 55.0 % were categorized as a healthy weight and 45.0 % were categorized as an unhealthy weight (i.e., overweight or obese). Please see Table 1 for health characteristics of this sample.

Table 1

Frequency of Health Characteristics of Preadolescent Children by Weight Status[1]

| Characteristic | Healthy weight | | Unhealthy weight | | All | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Gender | | | | | | |
| Boys | 4 | 36.4 | 5 | 55.5 | 9 | 45.0 |
| Girls | 7 | 63.6 | 4 | 44.4 | 11 | 55.0 |
| Total | 10 | 100.0 | 9 | 100.0 | 19 | 100.0 |
| Television watching | | | | | | |
| ≤ 1 hour/day | 5 | 50.0 | 4 | 44.4 | 9 | 47.4 |
| ≥ 2 or more hours/day | 5 | 50.0 | 5 | 55.5 | 10 | 52.6 |
| Total | 10 | 100.0 | 9 | 100.0 | 19 | 100.0 |
| Exercising (out of breath) outside of school | | | | | | |
| ≤ 3 hrs/week | 5 | 45.5 | 8 | 88.8 | 13 | 68.4 |
| ≥ 4 hrs/week | 5 | 45.5 | 1 | 11.1 | 6 | 31.6 |
| Total | 10 | 100.0 | 9 | 100.0 | 19 | 100.0 |
| Eating vegetables | | | | | | |
| ≤ 1/ week | 3 | 30.0 | 3 | 33.3 | 6 | 31.6 |
| ≥ 1/day | 7 | 70.0 | 6 | 66.6 | 13 | 68.4 |
| Total | 10 | 100.0 | 9 | 100.0 | 19 | 100.0 |
| Eating Fruit | | | | | | |
| ≤ 1/week | 1 | 10.0 | 4 | 44.4 | 5 | 26.3 |
| ≥ 1/day | 9 | 90.0 | 5 | 55.5 | 14 | 73.7 |
| | 10 | 100.0 | 9 | 100.0 | 19 | 100.0 |
| Eating French Fries | | | | | | |
| < 1/week | 7 | 70.0 | 3 | 33.3 | 10 | 52.6 |
| ≥ 1/week | 3 | 30.0 | 6 | 66.6 | 9 | 47.4 |
| Total | 10 | 100.0 | 9 | 100.0 | 19 | 100.0 |

[1]Data missing for one healthy weight participant

*The Meaning of the Rural Context*

Graue & Walsh (1998) described context as relational and stressed the importance of not only distinguishing and exploring the local and the larger context within which the child interacts, but to discover the relationship between these environments. Overall, the

rural context for this study was observed as one that created a sense of reciprocal engagement and entrustment between the child, the family, and the community. Cultural symbols of rurality such as "the wide open spaces" and the sense of "safety" and "freedom" were described and explained as contributing to health and healthy behaviors by the children and the parents. The rural environment appeared to be valued by parents and children, such as this parent stated " I believe everyone's looking out for everybody's kid" and the child who explained that "pretty much everybody around you helps you in different ways". The overall analysis of the cultural meaning of health in this group of children was interpreted within the rural context described above.

*The Meaning of Health*

From the interviews it appeared that all children were aware that to be healthy one must participate in physical activities (e.g., playing sports, building forts, ride bikes, run around outside, gopher shooting), avoid inactivity (e.g., don't watch television all day, try to stay off the computer), and eat a healthy diet (e.g., eating fruits and vegetables, eat from the four food groups, don't eat junk foods, don't eat too much). As children's knowledge and behaviors were further explored it appeared that to this group of children the cultural meaning of 'being healthy' was an integration of three overarching themes: *Knowing Stuff, Having a Working Body*, and *Feeling Happy*. Of these themes children clearly recognized the feeling of happiness as the most meaningful to them. Children who were of healthy and unhealthy weight used similar statements such as "Healthy means being active, and having fun, and being happy" and stated that "If you don't feel good about yourself you really have no reason to do either of the others" (i.e., "Knowing Stuff" or "Having a Working Body"). It also became evident that the meaning of health was

thematically congruent from the perspectives of children who were a healthy weight and children of unhealthy weight children.

*"Feeling happy"*. The first cultural theme that emerged from the data was that of *Feeling Happy*. For this group of children, *Feeling Happy* was a positive state that emerged from their relationships and activities and positively influenced their desires and ability to make healthy choices. Children's parents clearly reiterated their children's views and the relationship between their children's beliefs of happiness and health. Regardless of weight status, happiness appeared to be fostered by valued relationships and enjoyable activities (Please see Table 2).

Healthy weight children in particular suggested that being happy enhanced their ability to make healthier choices. As one child suggested " like you're happy and you feel like exercising and doing stuff that keeps you healthy" while another stated that " Usually when I'm happy I like eat healthier like I eat healthier foods like carrots and vegetables and that…when I'm not happy I eat something like chips". Other children suggested that being happy also assisted them in refraining from unhealthy behaviors. As one child stated "if you're happy then it helps you to like not want to eat an overbalanced diet and stuff".

Table 2

Data Bits of the Theme of "Feeling Happy" by Children's Weight Status and Parent Perceptions

| Theme | Children of Healthy Weight | Children of Unhealthy Weight | Parents |
|---|---|---|---|
| *"Feeling Happy"* | "I think being healthy means eating all the right foods, staying in shape, like having fun and being happy" | "Healthy means being active and having fun and being happy" | 'I think for him health, being happy, and being able to go to his friends but yet still having a solid concrete foundation family wise is a big thing for him" |
| Things that make you happy | "Being around friends and family, and my dog" | "Being with my friends and family and my pet" | |
| | "I usually feel really happy when I'm having a lot of fun…like when I'm outside I usually always have fun" | 'Its just funner to do things with them (friends)" | |
| | "I really like being with my family, it makes me happy" | 'I will just work outside with my dad on the truck or I'll mow the lawn, it's just fun to be outside I guess" | |
| Encouragement | "Like you want to do it more"<br>"I feel that that's the right decision and I should do that" | "You feel good and you feel like you can do good"<br>"I feel confident and I think I can do it" | "So he was happy so he was more inclined to do positive lifestyle things" |
| Support | "It feels good to know that you can trust everybody that you know to help you with anything you need help with" | "It makes you feel better and confident in yourself" | "It's the family setting, where you know somebody's going to be there if you need help" |

The feelings of encouragement and support were two other aspects of children's culture that appeared to contribute to the feeling of happiness. Children described encouragement as a positive persuasion that came from parents, friends, siblings, and teachers. Feeling encouraged appeared to influence the actions of children (i.e., healthy weight and unhealthy weight) and promoted a belief in their own abilities and decisions. Children valued the beliefs of others regarding their abilities, such as this child stated when he was encouraged he felt "more than good…great" because "someone's like believing that you can do it and stuff".

The feeling of 'support' emerged as children discussed the value of having friends and family. Children of either weight status explained that being supported referred to others "taking care of you" and resulted in a feeling of comfort. Parents were seen as an expected source of support in the provision of activities, food, and emotional support, as this child explained, "I know that my parents will help me to have a balanced diet and not overeat and stuff…and they always let me be in all the sports I want". Friends appeared to be valued for their social (e.g., company in activities) and emotional support, which often occurred simultaneously. Children discussed spending a lot of time with friends and the importance of having "time to talk about things and stuff".

*"Knowing stuff".* Most children stated they believed that it was important to learn about health. Children (i.e., healthy weight and unhealthy weight) frequently discussed the "food pyramid" and the influence of foods, such as this child explained that foods " give all the stuff you need calcium, iron, nutrients, they build muscles and keep your bones healthy". Although children did not frequently refer to the intensity, duration, and frequency of physical activity, exercise was perceived as a benefit for the body. As

children described their knowledge it became evident that with the acquired knowledge came a reflecting of that knowledge or a 'knowing' in which children stated that "knowing stuff" shaped their thoughts and beliefs and directed behaviors. Parents validated children's responses and also observed the transfer of knowledge from school to home behaviors (See Table 3).

*"Having a working body"*. In interpreting the cultural knowledge and beliefs surrounding children's physical activities and eating habits, it became apparent that performing these activities had further meaning to children. That is, children believed that their physical activities and eating patterns contributed to their health because they resulted in having a body that was in shape and functioned properly. Being "in shape" was described as "not too skinny like I'm not bones or I'm not too um big". These beliefs were similar in children who were a healthy weight and an unhealthy weight. (See Table 3). Parent responses supported children's beliefs. While parents did not use the term "in shape" they discussed their children's beliefs and attitudes towards weight. Parent's felt that children understood that being an unhealthy weight influenced their health and that healthy eating and exercise was linked to "the whole weight thing".

Table 3 Data Bits of the Themes of "Knowing Stuff" and "Having a Working Body" by Children's Weight Status and Parent's Perceptions

| Theme | Children of Healthy Weight | Children of Unhealthy Weight | Parents |
|---|---|---|---|
| *"Knowing Stuff"* | | | |
| - Shapes thoughts and beliefs | "you can think of actions and you can also think about exercises and stuff".<br><br>"if you're a kid and you eat healthy and you exercise it gives you good results when you are older" | "If you know things then you can know what's right and what's wrong, like to balance your diet"<br>"If you know about…stuff then that helps you"<br>"keeps you focused on a healthy life" | "Well, he's taken healthy eating through school classes. He knows the proper foods he should be eating. He does quite well at home." |
| - Directs behavior | "Like the food guide says you're supposed to have that amount of each so usually you make sure that you have that much during the day" | "If you know about exercise then you would probably do it a lot more" | "she knows that the diet and eating habits she has now will see her through a lifetime." |
| *"Having a Working Body"*<br>- A functioning body | "Like you watch what you eat and your body is completely working"<br>"Its really good to exercise, it makes your muscles stronger" | biking "builds your muscles and makes it easier for you to be active"<br>"Eat your 4 food groups…they build muscle and keep your bones healthy" | "She know that she needs exercise to keep her heart and lungs in shape' and "that eating too much junk food makes you tired an lazy and not active" |
| - An "in shape" body | "I feel good um my body like it has a good shape to it" | "If you eat a lot of grease you get fat, and if you eat vegetables you stay in better shape" | "She eats healthy because at some point in her life, eating healthy will maintain her weight at an appropriate level...she knows that" |

## Discussion

Over the last four decades, children's knowledge of healthy behaviors and their beliefs of health have remained relatively consistent. Previous studies conducted with children have reported that factors such as healthy eating and being active contributes to health, and that being healthy has a multidimensional component that frequently includes an absence of disease (Hester, 1987; Rashkis, 1965; Normadeau et al., 1998). Children in this study described their cultural meaning of health as a sense of *Knowing Stuff*, *Having a Working Body*, and *Feeling Happy*. Of these three themes, *Feeling Happy* appeared to be the most meaningful to this group of children. A few recent studies have reported that children included being happy (Onyango-Ouma et al., 2004; Piko & Bak, 2006) within their overall conceptions of health. However, other studies suggested that children most frequently reported functionality (e.g., being able to do wanted things, practicing sports) (Normandeau et al, 1998; Onyango-Ouma et al., 2004) when reporting their perceptions of health whereas the meaning of health for the children in this study emphasized the psychosocial aspects of health. The difference between the findings of the present study and previous studies of children in particular may be a result of the in-depth methodology used in the present study or the different cultures in which the studies were conducted. The findings then were unique to this group of children.

Another finding that may also be a reflection of the methodology is that children in this study did not include the absence of disease or illness within their meaning of health, unlike previous studies. It may also be or a reflection of a supportive rural community. Overall, it is encouraging that children's meaning of health are similar to the holistic definition of health proposed by the World Health Organization (WHO, 1978)

that stated “Health is a state of complete physical, mental, and social well-being and not merely the absence of disease and infirmity”.

As the dimension of *Feeling Happy* was further explored children often discussed their relationships with family and friends. While previous studies reported that children believed that having family and friends was important for health (Piko & Bak, 2006; Normandeau et. al, 1998), the children in the present study explained that it was specifically the encouragement and support that they received from these relationships that influenced their happiness and contributed to their health. Perhaps further exploration of the concepts of encouragement and support may be beneficial in discovering if they have a relationship with healthy behaviors and how these aspects can be incorporated into health promotion programs for children.

Interestingly, only children who were of healthy weight described how their feelings of happiness contributed to their patterns of health behavior. To our knowledge there is no previous work that has reported similar findings. It may be of interest to explore if a relationship between happiness and healthy behaviors truly exists in children, and if so what factors contribute to this relationship.

Participating in healthy behaviors was important to this group of children because it meant having a functioning body and a body that was in shape. Previous studies have reported that children value a functioning body (Onyango-Ouma et al., 2004; Piko & Bak, 2006), and as in the present study, believe that a functioning body allows one to participate in desired activities because various aspects of the body (e.g., heart, lungs, muscles) are working well. In this study, children (i.e., both healthy weight and unhealthy weight) believed that healthy behaviors resulted in a body that was in shape (i.e., “not to

skinny…and not too big") and that being in shape meant you were healthy. Interestingly, most children (85%) reported that their weight was fine even though many of the children (45%) were an unhealthy weight. This finding is consistent with a previous study that reported an incongruence between perception of weight status and actual BMI's where many overweight children classified themselves as a normal weight or underweight (Snethen & Broome, 2007). Additionally, regardless of weight status most children (95%) categorized themselves as healthy. This is an interesting finding and in contrast to a previous study that reported children's self rated quality of life (i.e., physical, emotional, social, and school functioning) decreased with increasing BMI scores (Williams, Wake, Hesketh, & Maher, 2005). It was not clear why the overweight children in the present study rated themselves as healthy. One explanation may be that the children associated health most with happiness rather than with physical functioning and body shape therefore believed if they were happy then they were healthy.

Children explained that their knowledge of healthy behaviors contributed to their meaning of health by positively influencing their beliefs and behaviors. While it was evident that children's knowledge was congruent with their thoughts and beliefs of their behavior, children's actual behaviors differed from those beliefs. For example, children suggested that knowing about physical activity would result in an increase in physical activities. However, many children (53%) watched two or more hours of television each day and the majority (68%) reported exercising, at an intensity that made them out of breath, for only three hours or less in one week. Previous studies have reported incongruence between children's knowledge and behaviors particularly as they relate to physical activity and eating patterns (Dixey, Sahota, Atwal, & Turner, 2001, Backett &

Alexander, 1991). Other factors such as self-efficacy, coping responses, or behavioral capability may influence children's behavior and would need further exploration to better understand this finding (Glanz, Rimer, & Lewis, 2002).

In this study, children and parents discussed their engagement in the community and appeared to value the safety, security, and freedom of the rural environment. Although there is a lack of studies that explored the rural environment from the children's perspectives, a study conducted with rural women reported positive factors such as open spaces, familiarity of people, and clean air contributed to their well-being (Thurston & Meadows, 2003). While it is evident that particular characteristics of the rural environments may pose barriers to healthy behaviors, it may be more beneficial to identify and capitalize on the strengths of the rural settings that may enhance healthy lifestyles. From this study it was apparent that children have the ability to articulate their understanding of the environment in which they live and play. Eliciting the beliefs of rural residents, particularly of children, would provide additional insights into such perceived strengths and their specific impact on the health and health behaviors of rural children.

*Factors influencing the study*. The factors influencing the study include the study sample, data collection tools, and methodology. A guiding assumption in ethnography is that a culture develops when a group of people is together and interacts over a period of time (Patton, 2002). While using a study sample from one particular school would ensure that the sample has a developed culture, the smaller sample only allows transferability of findings to a similar sample of children.

The health questionnaire was based primarily on a questionnaire that was designed for adolescents. To address this limitation, children were asked to take the questionnaire home and complete it with a parent or guardian thus decreasing the possibility of children's potential lack of understanding of the questions. The windshield survey collected observational data on the target community. The limitation of this method is that this data was the perceptions of the researcher at one point in time and may not reflect the reality of the residents of that community. To address this limitation to some degree, the windshield survey was conducted on two different days and at different times of the day. The windshield survey however was not collected at different seasons of the year, which may limit the view of the community.

*Implications for practice and research*. This study revealed that the prevalence of overweight and obesity is high in this rural population. Fundamental to obesity prevention in children is the promotion of health and healthy behaviors. The themes in this study revealed cultural and environmental aspects of the children that may be integrated into assessment of children's health and into programs or interventions aimed at promoting the health in rural preadolescent children. For example, it may be essential to consider children's happiness or the amount of encouragement or support they receive when developing interventions aimed at promoting healthy behaviors in children. Further research with larger samples more diverse age range, or with urban children may provide a greater understanding of the culture of children and how this culture impacts behaviors and attitudes towards health. Additional studies that explore the rural environment from the children's perspectives would add to our knowledge of how rural environments influence health and healthy behaviors in children.

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# GENERAL DISCUSSION

Developing an accurate understanding of children's values, norms, and beliefs about health are necessary for the development of age appropriate health promotion programs (Piko & Bak, 2006). The ways in which health and illness are perceived and interpreted are closely linked to cultural meanings that are created within social and environmental contexts (Alexander & Seidman, 1990; Loustaunau & Sobo, 1997). Understanding of the definition of 'health' is the foundation of health promotion efforts at the individual, family, or community level (Pender, Murdaugh, & Parsons, 2002). The most widely used definition of health is a multidimensional perspective of the World Health Organization (1978) which states "health is a state of complete physical, mental, and social well being and not merely the absence of disease or infirmity". An unhealthy body weight in children or a body weight that is greater than 20% above the average for age and sex (Berk, 2006) has been associated with ill health (Sherry & Dietz, 2004). In children this excess of body weight (i.e., overweight or obese) has been found to negatively influence the physical (i.e., metabolic, orthopedic, neurological, pulmonary, gastroentrolgical, endocrince), mental (e.g., low self esteem, depression), and social (e.g., discrimination, stigmatization) states of health (Lobstein, Baur, Uauy, & IASO International Obesity, 2004; Must & Strauss, 1999). A healthy body weight in children therefore is desirable as it may avoid multiple health issues and contribute to children's overall health.

Decades of research has provided an extensive knowledge base on the prevalence, causes, and consequences, and management of overweight and obesity in children. From these studies it has become abundantly clear that childhood obesity has reached epidemic

proportions and currently continues as a serious health concern for children. In Canada, 26% of children aged 2 –17 yrs have been categorized as overweight or obese (Statistics Canada, 2005). Although there is limited data on preadolescent children living in rural Saskatchewan, previous Canadian studies with adults (Shields & Tjepkema, 2006) and of youth (aged 11 –17 yrs) (Brunner, Lawson, Pickett, Boyce, & Janssen, 2008) suggested the prevalence of overweight and obesity is higher among rural populations compared to populations living in urban settings. Despite the research in this area of study, currently the prevalence of overweight and obesity in children living in rural settings appears to be high. This knowledge prompts questions about how to best approach and address this trend in rural populations and recognizes the need for more research with these populations. Thus as a foundation to the development of interventions aimed at obesity prevention in children, it is important to first develop an understanding of the cultural meaning of health of children and how this culture may influence patterns of health behaviors.

The purpose of this study was to explore the meaning of health of preadolescent children living in rural Saskatchewan. The three papers in this dissertation reflected this process in the following manner: Paper 1 explored the methodological considerations in designing a mixed methods study with rural children, Paper 2 focused on the quantitative component of the study and provided the context and descriptive data which was used to select participants for qualitative follow-up, and Paper 3 addressed the mixed methods findings of the study and discussed the contextualized meaning of health from the perspective of this group of rural children.

This research study discovered that the meaning of health for a group of children had a strong emphasis on the psychosocial aspects of health. Children identified the importance of *Feeling Happy* and of associated relationships that influenced the feeling of happiness. Additionally, participating children acknowledged and valued the physical environment in which they live and play. Previous studies (Piko & Bak, 2006) have stressed the need to develop accurate understandings of children's beliefs of health for the development of effective health promotion programs. The results of this study suggest that health professionals may need to be attentive to the psychosocial aspects of children's health not only in the development and implementation of health promotion programs but also possibly in the assessment of children's overall health. Furthermore, in addition to developing an accurate understanding of children's beliefs of health as suggested by Piko & Bak, it may also be beneficial to increase the accuracy of our understanding of the environment in which children interact by eliciting the voices of children's within this process and incorporating such 'insider' knowledge in the development of programs aimed at promoting health in children.

The main strengths of this study are threefold, this study: (a) increased the depth of understanding of children's cultural meaning of health discovered by the ethnographic and interpretive approach of the study, (b) explored the health and meaning of health in a group of rural Saskatchewan children for which there is limited knowledge and (c) assessed overweight and obesity using objective measurement of heights and weights and measured associated health characteristics of this group of children using a previously validated health questionnaire. Factors influencing the findings of the study included the low response rate for the quantitative component of the study, the self report of health

behaviors (e.g., physical activity, sedentary activities, dietary patterns), and the exploration of health and health behaviors at only one point in time. The specific questions for the present study were chosen from the Health Behavior in School Aged Children Survey (WHO, 2007) and were related only to physical activity, physical inactivity, and food frequency patterns. This presented limitations to this study as other characteristics of healthy behaviors (e.g., smoking, sleep patterns) were not addressed in the quantitative component of the study, and thus may have biased the subsequent qualitative interviews. Using a single time point may not accurately reflect the seasonal differences in health behaviors that may occur particularly in this province and country. Despite the limitations that can influence interpretation of the findings of this study, the overall findings contribute to the current and limited literature related to: (a) overweight and obesity in Canadian children, (b) preadolescent children's meaning of health, and (c) the rural context and environment.

Contributions to Obesity Literature

As a homogeneous rural sample, this study contributes to the limited knowledge that is available on the prevalence of overweight and obesity of rural children particularly of rural children living in Saskatchewan. The findings from the first phase of this study confirmed that the prevalence of overweight and obesity in this group of children was high and at least as high as other children living in Canada (Shields, 2005). Additionally, this study also found a gender difference in the prevalence of overweight and obesity reporting a higher prevalence of overweight and obesity in young boys, ages 6 to 8 years, compared to girls. Previous studies of gender differences in childhood obesity of rural children are conflicting with some studies reporting a higher prevalence of overweight in

boys compared to girls (Galloway, 2006; Shields, 2005) or no gender differences (Joens-Matre et al., 2008). While the present study contributed to our knowledge of potential gender differences of overweight and obesity in this group of rural children, further research is needed to clarify and confirm this finding in rural Saskatchewan children. The high prevalence of overweight and obesity in this sample and particularly the young age at which this difference is evident supports the need for appropriate interventions aimed at promoting healthy weights in rural children and of interventions that pay particular attention to the uniqueness of age and gender.

Patterns of physical activity and patterns of sedentary behaviors have been found to contribute to the increase of overweight and obesity in children (Anderson & Butcher, 2006). Although the data in the present study was self report, the tool used to measure health characteristics was based on portions of the 1997-1998 Health Behavior in School-Aged Children Survey (HBSC) (WHO, 2007). The HBSC is a multi national school based survey aimed to gather information of young people's (aged 11-15 yrs) health and health behavior's (WHO, 2007). The HBSC questionnaire was developed by an international research network of multidisciplinary experts and used in all countries participating in the research study (WHO, 2007). While reliability and validity are not available for the questionnaire as a whole, previous studies have assessed specific components of the HBSC survey. A study conducted to assess the reliability of the food frequency questions of the HBSC reported the kappa values between the test-retest ranged from 0.43 to 0.70, percentage agreement from 37% to 87%, and Spearman correlation from 0.52 to 0.82 (Vereecken & Maes, 2003). To assess the relative validity Vereecken and Maes compared the HBSC food frequency questions with a 24 hour food

behavior check list and with a 7-day food diary. This study reported that while a good agreement for some foods was evident in both instruments, an overestimation was found in foods such as diet soft drinks, and milk products. Physical activity questions were assessed using an aerobic fitness test to assess validity and reliability (Booth, Okelt, Baumnan, 2001). In this study for girls and boys in grade 8, reliability testing using a test-retest format resulted in Kappa values between 0.12 and 0.25 and percentage agreement from 67% to 70%. Validity tests reported the active groups of boys and girls had significantly higher aerobic fitness that the inadequately active groups. Thus, while the validity of the questionnaire for assessing physical activity seems reasonable the reliability may be questionable.

The findings in the present study indicated that many rural children watch more than the recommended hours of television. Additionally, this study identified that many rural children also spend several additional hours in sedentary behavior while commuting to school and extra curricular activities on a regular basis. These findings suggest that television watching and commuting may play significant roles in the overall sedentary behaviors of rural children. Further research that objectively measures and describes sedentary behaviors and particularly commuting patterns of rural children may contribute to our knowledge of health behaviors and to the development of programs aimed at promoting healthy behaviors in rural children.

Contributions to the Literature on Children's Meaning of Health

The ethnographic and interpretive approach of the present study resulted in an increased depth of the cultural meaning of health in rural children that has not been evident in previous studies. The children in this study clearly explained their meaning of

health and aspects of their lives that foster their meaning of health. Of particular interest in this study was the emphasis that this group of rural children placed on 'Happiness'. Additionally, children also explained that receiving encouragement and support from valued relationships fostered their sense of happiness and health. The meaning of health as described by this group of children differed from other studies of rural adults (Elliott-Schmidt & Strong, 1997) and rural children (OnyangoOuma, AagaardHansen, & Jensen, 2004; Piko & Bak, 2006) where functionality (i.e., being able to do desired activities, absence of disease) emerged as being most important to health. This contrast may be a result of perceptions that were unique to this particular group of children or may be a result of the in-depth interpretive approach of the present study which resulted in a deeper understanding of the meaning of health in this group of rural children.

While further research is needed to explore and confirm the meaning of health in larger more diverse groups of children, the results raise questions of the traditional manner in which health has been assessed and measured in child populations (e.g., anthropometric measures versus measures of happiness). Additionally, as others have suggested, children may view health differently than adults (Natapoff, 1982), and as demonstrated in the present study, have specific ideas of factors that foster their health behaviors (e.g., encouragement and support). Thus, when planning health promotion programs aimed at influencing the health of children, it may be prudent to include children within the planning process. Additional research on the relationship of factors such as encouragement and support with healthy behaviors or happiness and healthy behaviors in children may provide evidence for the specific integration of such factors into interventions for children. Additionally, further exploration of the concept of

happiness in children to discover if this concept is reciprocal with health may be of interest and one of the next steps in this area of research.

Contributions to Literature of Rural Context and Environment

Previous literature has identified the influence of context and environment on health and disease (Shah, 2003). More specifically, studies have identified the impact of the environment on childhood obesity (e.g., accessibility to convenience foods, family leisure time activity) and the need to consider these aspects in the development of interventions aimed at obesity prevention (Franzini et al., 2009; Davison & Birch, 2001). Recent literature has discussed socioeconomic and cultural factors within rural environments (e.g., access to health services, poverty, and family lifestyle patterns) that may influence health (Beard, Tomaska, Earnest, Summerhayes, & Morgan, 2009). These factors however are often interpreted from an adult lens. Few studies have included children in exploring the rural environment. In this study, in addition to discovering the cultural meaning of health in the sample of rural children, this study interpreted the rural environment from the perspectives of rural children. In doing so, it became evident that rural children perceive the rural setting in a positive manner and appear to value the wide open spaces and freedom in which they live and play. Furthermore, this study demonstrated the ability of children to articulate their understanding of their environment. So while challenges to maintaining healthy behaviors in the rural environment are well documented (Abbott & Olness, 2001), it appears that this group of children recognized the strengths of this rural setting. These findings provide insight into children's perception of the rural setting and of potential strengths of this environment which may

be supported by children and therefore useful to incorporate into health promotion or obesity prevention programs (e.g., encouraging the use of open spaces).

## Implications for Nursing Practice

Previous research and the results of this study clearly recognize that rural children are in the midst of an obesity epidemic. Health professionals are faced with the challenge of developing programs or interventions which are suitable and acceptable for children, sustainable for children and communities, and effective for preventing the progression of this epidemic and perhaps even reversing this trend. This study has shown that rural children have explicit ideas of health and their environment and have the ability to articulate these ideas thoughtfully. Engaging children in the process of developing programs aimed at promoting *their* health may be a productive strategy in the success of this process. Additionally, while the rural environment may include barriers to developing and maintaining health behaviors, the strengths of this setting should not be ignored when considering methods of health promotion for child populations in this setting.

## Conclusion

This research was the first to use a mixed methods ethnographic approach in exploring health with a group of rural children and in exploring health and obesity in children. This study has strengthened our understanding of health in this population. The findings of this research study are valuable for current and future practice and research. At present, this new knowledge of health may be integrated into the development of interventions or health promotion programs aimed at promoting healthy weights and healthy lifestyles in children. The findings also generate hypotheses for future research

regarding the concept of health in children and of aspects fostering health in this population.

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Appendix A
Letter of Ethical Approval

UNIVERSITY OF SASKATCHEWAN

Behavioural Research Ethics Board (Beh-REB)

## Certificate of Approval

PRINCIPAL INVESTIGATOR
Debra Reinke

DEPARTMENT
Institute of Agricultural Rural and Environmental Health

BEH#
07-230

INSTITUTION(S) WHERE RESEARCH WILL BE CONDUCTED/STUDY SITE
University of Saskatchewan

STUDENT RESEARCHERS
Hope N. Bolinski

SPONSOR

TITLE
The Meaning of Health within the Culture of Healthy Weight Children

| APPROVAL DATE | EXPIRY DATE | APPROVAL OF |
|---|---|---|
| 16 Jan 2008 | 15 Jan-2009 | Ethics Application<br>Consent Process |

CERTIFICATION
The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair, Research Ethics Board (ors.damron) in advance of its implementation.

ONGOING REVIEW REQUIREMENTS
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date (each year the study remains open, and upon study completion). Please refer to the following website for further instructions: http://www.usask.ca/ethics/ethics.php

John Rigby, Chair
University of Saskatchewan
Behavioural Research Ethics Board

Signature Date 16/01/08

Please send all correspondence to:

Ethics Office
University of Saskatchewan
Room 308 Kirk Hall, 117 Science Place
Saskatoon SK S7N 5C8
Telephone: (306) 966-2084 Fax: (306) 966-2069

Appendix B
Letter of Approval from School Division


**Horizon School Division #205**

*A Community of Learning and Achieving*

110 Main Street P.O. Box 100 Lanigan, SK S0K 2M0
Tel. (306) 365-4888 Fax (306) 365-2808
www.hsd.ca


January 31, 2008

Hope Bilinski, RN, PhD Candidate College of Nursing
Room 327 St Andrew's College
1121 College Drive
University of Saskatchewan
SASKATOON SK S7N 0W3

Dear Ms. Bilinski,

This letter is in reply to your request to conduct a research study entitled *'Rural Children's Study on Health'* in the Watrous Elementary School in Horizon School Division. I am pleased to provide you with this letter of approval contingent upon the approval of the Principal, Mr. Rob McGregor.

Thank you for your work in addressing the need to get more information about the health of rural children. Horizon School Division appreciates this opportunity to partner with you and the College of Nursing at the University of Saskatchewan. All the very best in your study!

Sincerely,

Marc Danylchuk
Director of Education
Horizon School Division No. 205
*A Community of Learning and Achieving*

Appendix C
Information Letter

Dear Parent of a Grade 1 to 7 student,

We are inviting you and your child to participate in a research study entitled *'Rural Children's Study on Health*' that is being conducted in the Watrous Elementary School. This research is part of my PhD studies at the College of Nursing at the University of Saskatchewan. The purpose of this study is to explore the values, beliefs, and knowledge that rural children have about their health. With you and your child's permission this information will be collected and the findings from this study will provide valuable information about the health of this group of children. It is hoped that the information can be used to improve the health of other groups of school age children living in rural areas. There are three parts to this study:

## *Part 1 & 2 is for all students in Grade 1 to 7*:

**Part 1**: A short survey to be filled out by the parent and child at home. This survey should take about 10 minutes to complete. If you have more than one child in grades 1 to 7, please fill out a survey for each child.

**Part 2**: We would like to measure your child's height and weight as part of their health assessment. These measurements will be taken at the school in a private location by the researcher who is a registered nurse. These measurements will be used to determine the child's body mass index ( $wt/ht^2$ )

## *Part 3 is for students in Grades 4 to 6 and their parents:*

**Part 3**: We would like to get a better look at what health means to children in Grades 4 to 6. Individual interviews will take place with children and their parents.
**Children** will be asked about their opinions on health in individual interviews that will take place during school hours. The interviews should last about 20 minutes.
**Parents** of the selected children will also be individually interviewed about factors that influence their children's health . These interviews will last about 30 minutes and will take place in the school at a time that is most convenient for the parent. Each child and parent will be interviewed twice, about one month apart.

It is hoped that all students from grades 1 to 7 and their parents complete the questionnaire and agree to the measurements of the student's heights and weights. We hope that you agree for follow-up interviews should you and your child be selected to participate in Part 3 of the study. You will be contacted by (date), if you have been selected for part 3 of this study.

Appendix C
Information Letter

The decision to participate in this study is entirely up to you and your child. Your decision to participate or not will have no effect your child's grades in any way. Any information provided through the questionnaires or interviews will be kept confidential and will be stored in a locked cabinet when not in use. Results will be reported as group results only. There are no foreseen risks in participating in the study, and if you or your child wishes, you may withdraw at any time.

If you and your child decide that you would like to be a part of this study, we ask that you both read and sign the attached consent form. You can complete the attached questionnaire and return both the signed consent form and completed questionnaire in the provided envelope to your child's classroom teacher by (date)**.** If you decide not to participate, please return the questionnaire packet to the school. All children who return a questionnaire (completed or not) are asked to enter their name for a prize that will be drawn for in each classroom.

Thank you for considering participating in this study. There is a definite need to get more information about the health of rural children from rural people themselves. If you or your child has any questions or concerns about this study, or would like to learn more about this study please do not hesitate to contact either Hope Bilinski (966-7849 or h.bilinski@usask.ca), or the study supervisors Dr. Donna Rennie (966-6234) or Dr. Wendy Duggleby (966-6237) at any time.

This study has been approved by the Behavioral Research Ethics Board at the University of Saskatchewan on (date). If you have any questions about your rights as a participant or concerns about the research project you may contact Research Ethics Office at the University of Saskatchewan at 1 306 966-2084.

_____

Hope Bilinski RN, PhD Candidate
College of Nursing
University of Saskatchewan

_____

Dr. Donna Rennie
Professor, College of Nursing
University of Saskatchewan

_____

Dr. Wendy Duggleby
Professor, College of Nursing
University of Saskatchewan

Appendix D
Health Questionnaire

**Dear Parent and Child,**

**The following information will be used to describe the children who will be participating in the study. A parent/guardian must help the child to fill out this survey. The information will be kept confidential. All results from the study will be reported only as a group and not as individual information.**

Child's Name: _____

Address: _____
Street or P.O. Box
_____
Town Prov. Postal Code

Phone Number: _____

Child's Age _____
Years

Child's birthday _____ _____ _____
Day Month Year

Child's grade _____

Is the child a _____ _____
Boy Girl

How long have you lived in the Watrous district? _____ _____
Years Months

**1. Which of these people live at your home? If your mother and father live in different places, answer for the home where you live most of the time.** ***(Darken one circle on each line)***

**I live with:** **Yes** **No**

| | | |
|---|---|---|
| a. Mother | O | O |
| b. Father | O | O |
| c. Stepmother | O | O |
| d. Stepfather | O | O |

**2. How many of the following persons live in your home?**

a. Sisters *(full,half,and step)*: _____

b. Brothers *(full,half,and step)*: _____

c. Grandparents: _____

d. Other people: _____

**3. What is your mother's highest level of education?**

O She did not finish high school
O She graduated from high school
O She had some education after high school
O She graduated from college
O Don't know

**4. What is your father's highest level of education?**

O He did not finish high school
O He graduated from high school
O He had some education after high school
O He graduated from college
O Don't know

**5. How many hours a day do you usually watch TV?**

O None
O Less than 1/2 an hour a day
O 1/2 an hour to 1 hour a day
O 2 to 3 hours a day
O 4 hours a day
O More than 4 hours a day

**6. How many hours a week do you usually play computer games?**

O None
O Less than 1 hour a week
O 1 to 3 hours a week
O 4 to 6 hours a week
O 7 to 9 hours a week
O 10 hours or more a week

**7. How many hours a week do you use a computer at home and at school, not counting computer games?**

O None
O Less than 1 hour a week
O 1 to 3 hours a week
O 4 to 6 hours a week
O 7 to 9 hours a week
O 10 hours or more a week

**8. Some activities are listed below. We would like to know about how often you typically take part in activities like the ones listed. Think about the last 12 months as a guide. Do not include school Physical Education classes. *(Darken one circle on each line)***

| | Usually every day | 2 or 3 times a week | About once a week | About once a month | Rarely or never |
|---|---|---|---|---|---|
| a. Play or practice an **organized or supervised** sport such as volleyball, football, basketball, hockey, soccer, cheerleading or swim team | O | O | O | O | O |
| b. Play **unorganized** sports such as rollerblading, tennis, swimming, bicycling, recreational swimming or pick-up games like basketball and football | O | O | O | O | O |
| c. Go to **classes** such as gymnastics, dance or karate | O | O | O | O | O |
| d. Participate in an **activity**, club or group such as Scouts, 4-H or religious organization | O | O | O | O | O |

**9. OUTSIDE SCHOOL HOURS: How many hours a week do you usually exercise in your free time so much that you get out of breath or sweat?**

O None

O About 1/2 an hour a week

O About 1 hour a week

O About 2 to 3 hours a week

O About 4 to 6 hours a week

O 7 hours or more a week

**10. How often do you eat or drink any of the following? (Darken one circle on each line)**

| | More than once a day | Once a day | Once a week, but not daily | Rarely (less than once a week) | Never |
|---|---|---|---|---|---|
| a. Fruit | O | O | O | O | O |
| b. Raw vegetables | O | O | O | O | O |
| c. Cooked vegetables | O | O | O | O | O |
| d. Coke or other soft drinks that contain sugar | O | O | O | O | O |
| e. Sweets (candy or chocolate) | O | O | O | O | O |
| f. Cakes or pastries | O | O | O | O | O |
| g. Potato chips | O | O | O | O | O |
| h. French fries or fried potatoes | O | O | O | O | O |
| i. Hamburgers, hot dogs, sausages | O | O | O | O | O |
| j. Whole wheat or rye bread | O | O | O | O | O |
| k. Low fat milk (1%, 2%, or skim) | O | O | O | O | O |
| l. Whole fat milk | O | O | O | O | O |
| m. Coffee | O | O | O | O | O |

**11. Are you on a diet to lose weight?**

O No, because my weight is fine

O No, but I do need to lose weight

O Yes

**12. How often do you feel tired when you go to school In the morning?**

O Rarely or never

O Occasionally (less than once a week)

O 1 to 3 times a week

O 4 or more times a week

**13. How healthy do you think you are?**

O Very healthy

O Quite healthy

O Not very healthy

**14. Where do you live for most of the year?**

O On a farm

O In town

O Other, please specify _____

If the child lives on a farm, how long has she/he lived on a farm _____

**15. Does you ride the bus to and from school on most days of the week?**

O Yes O No

**If yes, how long does it take each day?**

To school _____ hour(s) _____ minutes

From school _____ hour(s) _____ minutes

**16. Are you driven to or from school on most days of the week?**

O Yes O No

**If yes, how long does it take each day?**

To school _____ hour(s) _____ minutes

From school _____ hour(s) _____ minutes

**17. Are you driven to other activities (sports, clubs, to visit friends) on a weekly basis?**

O Yes O No

**If yes, how long does it take each week?**

To activities _____ hour(s) _____ minutes

From activities _____ hour(s) _____ minutes

*This completes the survey.*
*Thank you both for your time in completing these questions. If you have any comments, please feel free to include them on the following page.*

*Comments:*

_____

_____

_____

_____

_____

_____

_____

_____

Appendix E
Interview Guide for Individual Interview with Child

**Questions**

1) Can you tell me about a healthy person?
   - What do healthy people do? Don't do?
   - What do they look like?
   - What do you do to keep healthy?

2) Can you tell me what being healthy means to you?

3) Can you tell me what kind of things at school help you stay healthy? At home?

4) Who are the people that help you most to stay healthy? How do they do this?

5) What kind of things at school make it hard for you to stay healthy? At home?

Appendix F
Interview Guide for Individual Interview with Parent

**Questions**

1) Can you tell me what being healthy means for your children?

2) What kind of things at school help them stay healthy? At home?

3) What kind of things at school make it hard for them to stay healthy? At home?

4) Who are the people that help them most to stay healthy? How do they do this?

Appendix G
Consent for Health Measures

**RETURN WITH QUESTIONNAIRE**

**PERMISSION TO PARTICIPATE**

I have read and understand the information provided to me about this research study entitled *'Rural Children's Study on Health'*. I understand that as part of this research study my child and I will be asked to complete a short questionnaire together at home about health. This questionnaire should take about 10 minutes to complete. I also understand that the researchers will be taking height and weight measurements on my child *(First and Last Name)* _____ in a private location at my child's school.

All the information provided in the questionnaire and the child's height and weight measurements will be kept confidential and will not be shared by anyone outside the research team. Although the information from this research study will be used in the researcher's thesis, and for publication in journals and conference presentations, all information will be in a group form so that it will not be possible to identify individuals. Also, the consent forms and the front page of the survey that have your name on it will be stored separately so that it will not be possible to associate a name with any given responses. I understand that my child can refuse to participate at any time and will have a chance to ask questions before the measurements are done. There are no foreseen risks to answering the questionnaire or having the child's height and weight measured. The researchers respect the decision by the child to participate or not. Should you choose to withdraw after the study has begun, you may ask that all the information you have provided be deleted and destroyed.

I agree to have all the information that my child and I provide to be used for the research study. My child and I agree to have his/her weight and height measured at my child's school. I have kept one copy of the consent for my records. I have explained this study and this consent to my child.

_____ _____

**Signature of the Parent/Guardian** **Date**

My parent has told me about this study. I know that my parent and I will be answering some questions about health and that someone will measure my height and weight in a private room at school. I know that I do not have to take part in this study if I do not want to and that no one will be upset it I decide not to be in this study. I also know that my name will not be used in any reports about this study.

_____ _____

**Signature of the Child** **Date**

Appendix G
Consent for Health Measures

**A smaller group of children in grades 4, 5, and 6 and their parents will be randomly selected for individual interviews.**

May we contact you for this follow-up study? ☐ Yes Phone Number_____

☐ No

Parent's Name (*Please Print Below)* *Address*

_____

Note:
Not all children/parents who agree for follow up interviews will be selected for further interviews.

This study has been approved by the Behavioral Research Ethics Board at the University of Saskatchewan on (date). If you have any questions about your rights as a participant or concerns about the research project you may contact Research Ethics Office at the University of Saskatchewan at 1 306 966-2084.

*If you have any questions or concerns, please contact any of the following:*
***Hope Bilinski**, RN, PhD Candidate, College of Nursing, University of Saskatchewan*
*1 306 966 7849*
***Dr. Donna Rennie**, Supervisor, College of Nursing, University of Saskatchewan*
*1 306 966 6234*
***Dr. Wendy Duggleby**, Supervisor, College of Nursing, University of Saskatchewan*
*1 306 966 6237*

Appendix H
Individual Interview Consent

**PERMISSION TO PARTICIPATE**

I have read and understand the information provided to me about the research study entitled *'Rural Children's Study on Health'*. I understand that my child and I will be interviewed separately and we will both be asked questions related to the child's health. All interviews will be audio taped. My child will be interviewed in a private location in school and the interview should last about 40 to 50 minutes. As a parent I will be interviewed in a private location that is most convenient for me and this interview will last approximately 40 to 50 minutes. After the researcher has looked at the information from the first interview, my child and I will be interviewed a second time to talk about the results from the first interview and discuss any other issues about this topic. All the information provided will be kept confidential and will not be shared by anyone outside the research team. Also, the consent forms will be stored separately from the interview transcripts so that it will not be possible to associate a name with any given responses. Although the information from this research study will be used in the researcher's thesis, and for publication in journals and conference presentations, your identity will be kept confidential. Should we report direct quotations from the interview, you will be given another name or a pseudonym, and all identifying information will be removed from our report. I understand that my child or I can refuse to participate at any time and may request that all the information we have provided be deleted and destroyed. There are no foreseen risks for the child or parent to participating in the interviews.

I agree to have all the information that my child and I provide to be used for the research study. I have kept one copy of the consent for my records. I have explained this consent to my child.

_____ _____

Signature of the Parent Date

My parent has told me about this study. I know that I will be answering some questions about health in an interview with a researcher. I know that I do not have to take part in this study if I do not want to and that no one will be upset it I decide not to be in this study. I also know that my name will not be used in any reports about this study.

_____ _____

Signature of the Child Date

Parent's Name (*Please Print Below)* *Address & Phone number*

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*If you have any questions or concerns, please contact any of the following:*

***Hope Bilinski**, RN, PhD Candidate, College of Nursing, University of Saskatchewan, 1 306 966 7849*
***Dr. Donna Rennie**, Supervisor, College of Nursing, University of Saskatchewan, 1 306 966 6234*
***Dr. Wendy Duggleby**, Supervisor, College of Nursing, University of Saskatchewan, 1 306 966 6237*

This study has been approved by the Behavioral Research Ethics Board at the University of Saskatchewan on (date). If you have any questions about your rights as a participant or concerns about the research project you may contact Research Ethics Office at the University of Saskatchewan at 1 306 966-2084.

Appendix I
Results of Windshield Survey of Watrous Community

| **I. Community Core** | Observational Data |
|---|---|
| **1. History**—What can you glean by looking (e.g., old, established neighborhoods; new subdivision)? Ask people willing to talk: How long have you lived here? Has the area changed? As you talk, ask if there is an "old-timer" who knows the history of the area. | - Subdivisions with older, but well-maintained homes, trees well established<br>- Several new homes being built<br>- Homes, yards, parks generally well maintained<br>- Several projects evident to upgrade homes and yards, eg) shingling, replacing siding, new turf, painting fences, paving driveways<br>- One trailer park with about 20 trailers, some newer and better maintained than others<br>- One new subdivision being created with 17 new lots |
| **2. Demographics**—What sorts of people do you see? Young? Old? Homeless? Alone? Families? Is the population homogeneous? | - A variety of ages in population evident; young mothers with babies in parks, school aged children biking around, middle aged women and men walking downtown or working in yards, and many older people walking downtown, pushing walkers with groceries in residential areas<br>- Appears to be primarily Caucasian people, one or two Asians families |
| **3. Ethnicity**—Do you note indicators of different ethnic groups (e.g., restaurants, festivals)? What signs do you see of different cultural groups? | - Appears homogeneous in ethnicity |
| **4. Values and beliefs**—Are there churches, mosques, temples? Does it appear homogeneous? Are the lawns cared for? With flowers? Gardens? Signs of art? Culture? Heritage? Historical markers? | - Seven churches and six denominations: Catholic, Baptist, Lutheran, Anglican, Untied, and Pentacostal<br>- The 'Senitaf'; a memorial park to the veterans, well kept, cement memorial very clean and neat<br>- The majority of yards well maintained, immaculate large vegetable and flower gardens<br>- Parks and equipment appear well maintained, painted, grass green and cut<br>- Murals on side of buildings<br>- Information center at the edge of town, the near-by mineral spa is advertised<br>- Large cement beautiful 'Welcome' sign<br>- Up grading and repairs being done on Civic center<br>- People waving to me and definitely do not know who I am |

Appendix I
Results of Windshield Survey of Watrous Community

| **II. Subsystems** | |
|---|---|
| **1. Physical environment**—How does the community look? What do you note about air quality, flora, housing, zoning, space, green areas, animals, people, human-made structures, natural beauty, water, climate? Can you find or develop a map of the area? What is the size (e.g., square miles, blocks)? | - Clean air, green spaces evident with two large parks, large lots with a lot of green space around hospitals, elderly housing units. An abundance of trees that are well established<br>- Most main streets are paved, no sidewalks except downtown<br>- Advertising the development of a new 5K walking trail to nearby village (mineral spa)<br>- The highway runs through the town although most of the town is on the north side of the highway with only the information center, car business, and grain elevator on the south side |
| **2. Health and social services**—Evidence of acute or chronic conditions? Shelters? Alternative therapists/healers? Are there clinics, hospitals, practitioners' offices, public health services, home health agencies, emergency centers, nursing homes,social service facilities, mental health services?Are there resources outside the community but readily accessible? | - Hospital, medical clinic, pharmacy, chiropractor, dental clinic, long term care facility, enriched housing units for the elderly, seniors complex<br>- School nurse employed by the health districts and visits the school on a regular basis |
| **3. Economy**—Is it a "thriving" community or does it feel "seedy?" Are there industries, stores, places for employment? Where do people shop? Are there signs that food stamps are used/accepted? What is the unemployment rate? | - Several thriving businesses; eg) car dealerships, many related to farm business such as farm machinery, farm repair, fertilizer company, grain elevators. Grocery stores, coffee shops (although there are some that have closed), clothing stores, green houses, banks, Sasktel offices, constructions company, concrete company, insurance companies, drilling trucks.<br>- Signs for jobs at local gas stations, coffee shops |
| **4. Transportation –** How do people get around? What type of private and public transportation is available? Do you see buses, bicycles, taxis? Are there sidewalks, bike trails? Is getting around the community possible for people with disabilities? What types of protective services are there (e.g. fire, police)? Do people feel safe? | - No formal bus system present. It appears people of all ages walk everywhere. Many children riding bikes. Many elderly downtown and in residential areas pushing walkers. It appears that downtown may be a distance for some elderly people however elderly seen with walkers full of groceries.<br>In interviews both children and parents verbalize how 'safe' they feel in this rural area. |

Appendix I
Results of Windshield Survey of Watrous Community

| **II. Subsystems** | Observational Data |
|---|---|
| **5. Politics and government**—Are there signs of political activity (e.g., posters, meetings)? What party affiliation predominates? What is the governmental jurisdiction of the community (e.g., elected mayor, city council with single member districts)? Are people involved in decision making in their local governmental unit? | - RM office<br>- Town office |
| **6. Communication—**Are there "common areas" where people gather? What newspapers do you see in the stands? Do people have TVs and radios? What do they watch/listen to? What are the formal and informal means of communication? | - Town newspaper every Monday<br>- Posters and bulletin boards in grocery stores and gas bars<br>- Coffee shops (2) appear busy<br>- Seniors center downtown<br>- Restaurants<br>- Many people stopping a talking on street in front of stores; men stopping and talking out of the truck windows |
| **7. Education**—Are there schools in the area? How do they look? Are there libraries? Is there a local board of education? How does it function? What is the reputation of the school(s)? What are major educational issues? What are the dropout rates? Are extracurricular activities available?Are they used? Is there a school health service? A school nurse? | - Two schools (elementary and high school)<br>- Community college housed in high school<br>- Public library downtown<br>- Civic center provides extracurricular activities such as bowling, curling, public gym |
| **8. Recreation**—Where do children play? What are the major forms of recreation? Who participates? What facilities for recreation do you see? | - At this time of the year (June) children are seen everywhere, in parks, biking in streets, in school grounds, downtown, coming out of civic center<br>- Preschoolers and mothers seen in main parks or in school playground during the day<br>- Outdoor swimming pool close to school<br>- Large baseball diamonds on one side of town<br>- Local golf course a couple miles out of town |

Appendix I

Results of Windshield Survey of Watrous Community

| **III. Perceptions** | Observational Data |
|---|---|
| **1. The residents**—How do people feel about the community? What do they identify as its strengths? Problems? Ask several people from different groups (e.g., old, young, field worker, factory worker, professional, clergy, housewife) and keep track of who gives what answer. | - Formal interviews of community residents not conducted however teachers and parents indicate that this is a "safe community" an a "good place to raise children" Parents speak about their fundraising efforts and commitment in time and resources to build, maintain, and keep facilities and programs in the community. |
| **2. Your perceptions**—General statements about the "health" of this community.<br>What are its strengths?<br>What problems or potential problems can you identify? | This community appears to be 'healthy' based the clean air, positive appearance, visible growth, maintenance of physical and social environments, and obvious activity of persons of all ages. There appears to be a strong infrastructure of devoted citizens to develop and sustain this community. |

Appendix J
Protocol for Height and Weight Measurements

The anthropometric data or the height and weight measurements will be used to generate body mass index scores [weight(kg)/height $(m)^2$] for each child. Using the international standards for childhood obesity, children will be classified by their body mass index score as a healthy weight, overweight or obese.

In a private location at the school, a trained professional will measure and record the children's height and weights. Measurements of the heights and weights will follow procedures suggested by Cole & Rolland-Cachera (2002) (See references in Study 1). Height will be measured twice to the nearest 0.1 cm using a stadiometer. The child will be positioned with the head held in the Frankfort plane (i.e. with the line of vision perpendicular to the body), the shoulders, buttocks, and heels touching the stadiometer. Weight will be measured twice to the nearest 0.1 kg using a digital scale. The child will be asked to remove shoes and any heavy clothing such as a jacket or a sweater. The two measurements of heights and weights will be averaged and recorded to the nearest 0.1 cm or kg.